Rhodora

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RHODORA.—**A monthly journal of botany, devoted primarily to the flora of the Gray's Manual Range and regions floristically related. Price, $2.00 per year, net, postpaid, in funds payable at par in United States currency in Boston; single copies (if available) of not more than 24 pages and with 1 plate, 20 cents, numbers of more than 24 pages or with more than 1 plate at higher prices (see 3rd cover-page). Volumes 1–8 or some single numbers from them can be supplied only at advanced prices which will be furnished on application; volumes 35–43 can be supplied at $4.00 per volume, net, and some single numbers from them only at advanced prices (see 3rd cover-page). Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be considered for publication to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than two pages of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.**

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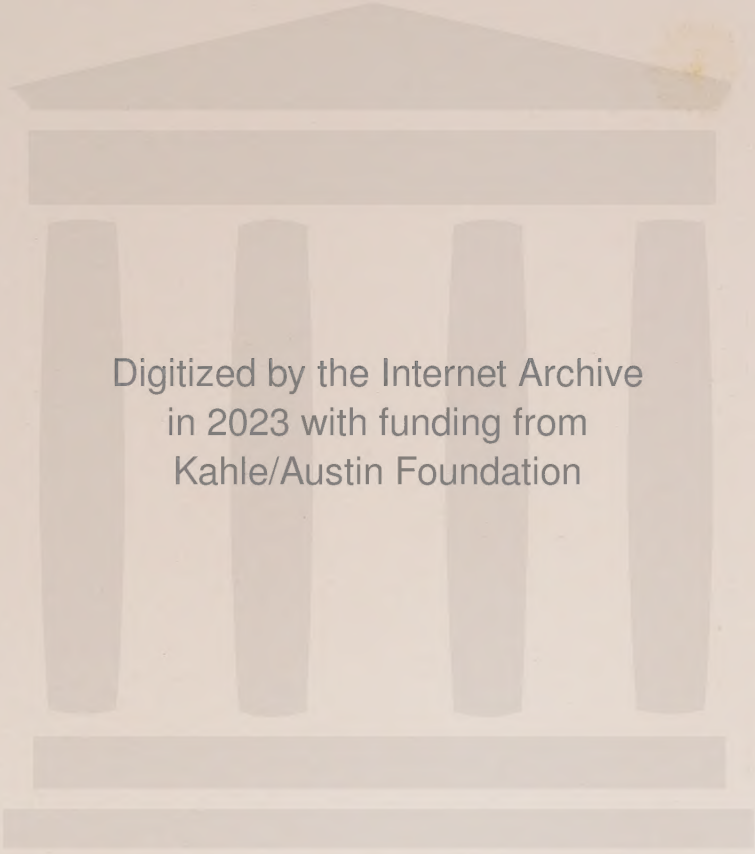

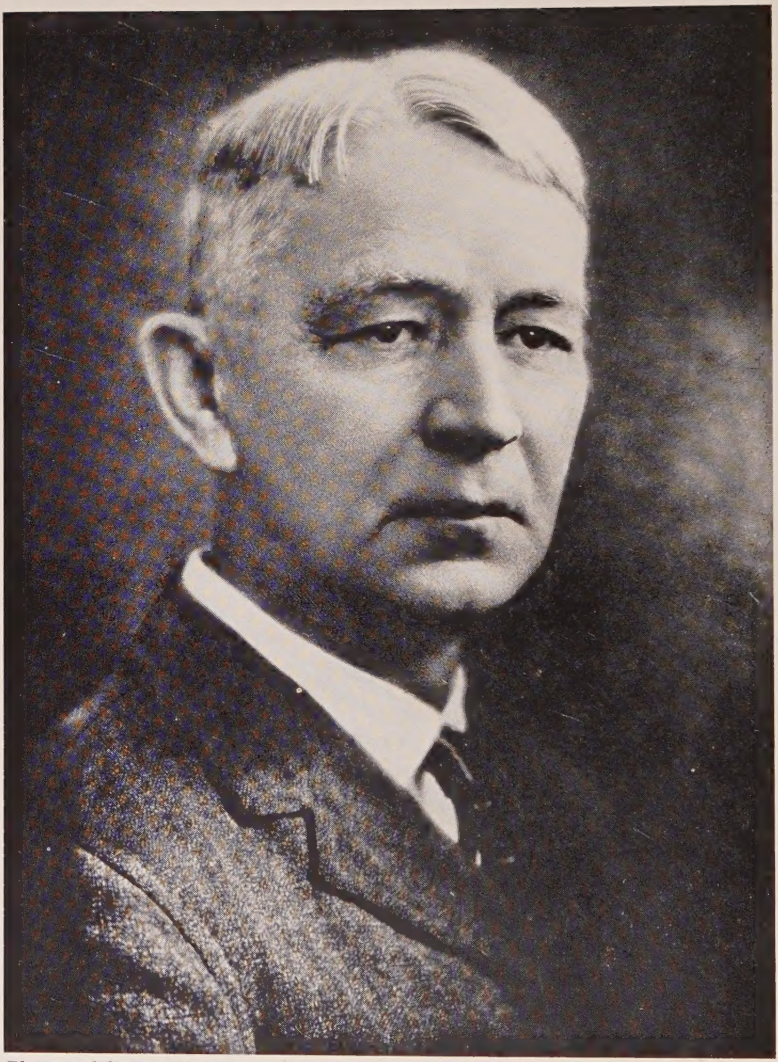

Photograph by Bachrach

Very truly
J. Franklin Collins

Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

Vol. 44. April, 1942. No. 520.

J. FRANKLIN COLLINS

Walter H. Snell

(With Portrait)

Professor James Franklin Collins, taxonomist and forest pathologist, died in Providence (Cranston), Rhode Island on November 14, 1940, after a long illness.

Professor Collins was born December 29, 1863 in North Anson, Maine. He moved to Providence in 1873, where he was educated in the grade and high schools. From 1879 to 1898 he was employed by the nationally known Gorham Manufacturing Company as a silver worker, designer and embosser. In his spare time he became interested in identifying the plants which he came across in his rambles over the State, and it was not long before he sought the assistance of Professor W. Whitman Bailey, head of the Department of Botany at Brown University. Young Collins showed such interest and displayed such skill in this field that Professor Bailey took him under his wing and assisted him in obtaining a technical background for his avocational efforts and opened the University Herbarium to the full play of his talent. In 1894, while still working at his trade at Gorham's, he was rewarded with an appointment as Curator of the Olney Herbarium at Brown University. In 1898, the University awarded him an honorary Ph.B. degree. In 1899, he gave up his work as a silversmith at Gorham's to accept an appointment as instructor in Botany at Brown. He was made an assistant Professor in 1905 and upon Professor Bailey's retire-

ment in 1906 he became head of the Department, in which position he remained until 1911.

In 1907, this versatile man branched out into another field of Botany, which was to develop into the main work of his later life. From that date to 1911, while still teaching at Brown, he became successively Collaborator, Agent and Special Agent in the Office of Forest Pathology of the United States Department of Agriculture, working chiefly upon the chestnut-bark disease. Then in 1913, when the late Dr. Haven Metcalf opened up a branch laboratory of the Office of Forest Pathology at Brown University to deal with the diseases of ornamental trees and shrubs, Collins was made Forest Pathologist and placed in charge. He was subsequently appointed Pathologist and Senior Pathologist-in-Charge. He did not give up his interest in taxonomy at any time during this period, but still spent his spare time collecting plants and building up his own herbarium. He was the unofficial taxonomist for the Office of Forest Pathology and at various times in several pathological investigations was called upon to solve the taxonomic aspects of these problems. He continued to serve as Curator of the Olney Herbarium and was appointed Demonstrator and Lecturer in Botany, in which honorary positions he served until the time of his retirement from the Government service in 1933.

The functions of the Providence Office and Laboratory which Collins administered were in general two:—diagnosis of diseases of shade and ornamental trees and shrubs from specimens submitted by correspondents over the entire United States, and suggestions for control; investigations of such diseases as needed particular attention because of their novelty or imminent or possible danger. The first project came to be a very important one. From the modest number of 8 requests for diagnosis or information in 1913, the number grew to 1,000 in 1932. The more special sorts of projects included the following: chestnut-bark disease; white-pine blister-rust; diseases of camphor, rhododendrons, boxwood, roses and Lawson cypress; needle-blight of white pine; European larch canker; willow scab; *Rehmiellopsis* disease of firs; *Cytospora* and *Sphaeropsis* diseases of conifers.

The technical aspects of the work just mentioned were as-

signed for the most part to members of his staff. A third type of investigation was entirely Collins' own. He early applied his energies and his common sense to the problems of the care and treatment of shade trees and his substantial accomplishments along this line laid the foundations for the scientific care of shade trees and earned him the title of "Father of Tree Surgery". He was responsible for four improvements in the protection of ornamental trees:—1) scientific methods of trimming, etc., instead of the crude tree-butchery too commonly practiced; 2) the open cavity, properly made; 3) a wood-filler for cavities instead of the inelastic cement; 4) a sawdust-asphalt mixture for a more flexible filling. He had the two latter cavity-fillers patented by the United States Department of Agriculture to make the methods available to the public. His Farmers' Bulletin number 1178 on "Tree Surgery" ran through 9 editions and revisions from 1920 to 1934, with a total of 210,000 copies, and Farmers' Bulletin number 1726, "Treatment and Care of Tree Wounds," five editions from 1934 to the present time, totalling 160,000 copies.

Collins was an expert on the higher plants, ferns and mosses. He was moderately well-informed about the fungi. He had an especially intimate knowledge of the natural history of Rhode Island. He knew every corner of the State, every crossroad, path and brook. He collected widely with other members of the New England Botanical Club, more especially in Maine and the Gaspé Peninsula. In the latter region he with his colleagues did a great deal of exploring of hitherto uncharted territory and because of his exploration of one mountain that peak now bears the name of "Mount Collins" and is so accepted by the Canadian Geological Survey. In his later work for the Government, he travelled considerably in this country to study trees and their diseases, the nation's forests and parks.

Collins' publications numbered over 100, with about a score each on the mosses and the chestnut-blight, and the others on ferns, local floras and miscellaneous higher plants. Outside of his "Tree Surgery" Bulletin, his best known work was "Key to New England Trees, Wild and Cultivated", with Howard W. Preston.

Collins was a member of the following organizations:—American Association for the Advancement of Science (Fellow),

American Forestry Association, American Phytopathological Society (Charter Member), Botanical Society of America, Josselyn Botanical Society of Maine (Chairman of Bryophyte Committee for 10 years), National Geographic Society, New England Botanical Club (Committee on Check List, 1901–1911), Rhode Island Botanical Club (one of founders and President several years), Rhode Island Field Naturalists Club (President 3 years, and member of Executive Committee 4 years), Rhode Island Horticultural Society (Botanist 4 years, on Lecture Committee 2 years), Sigma Xi, Brown University Chapter (Treasurer 2 years), Sullivant Moss Society, Torrey Botanical Club. From 1929 to 1936 Collins was an Associate Editor of Rhodora, freely giving his services in the preparation of illustrations.

Collins was a mechanical genius, typically Yankee. He was expert in the use of all kinds of tools and in the utilization of all kinds of materials, but the lack of complicated tools or of special materials was no obstacle to him. With the simplest of facilities, he could make unbelievable things. In the 5 and 10 cent store he could find small items which he could put to a dozen uses, cheap glassware that obviated the purchase of more expensive material from the supply houses. Neither was lack of physical space any hindrance or source of discouragement. He could make an office out of a pillbox and a laboratory out of a closet, by economically using every cubic inch of volume. Folding or sliding tables and benches, shelves on every available bit of wall space and even suspended from the ceiling, sets of drawers and cases ingeniously arranged provided working or storage space where both appeared impossible. A few black curtains pulled down from the ceiling and the proper array of folding benches slipped from their catches would provide a dark-room in the corner near the sink. Collins liked to tinker; if he was ever happier doing anything than collecting and caring for his plants, it was when he had tools in his hands. This propensity and Collins' unfailing good nature were often taken advantage of by his colleagues (including the writer). It was soon found that if he were asked outright to do some little job, he was somewhat reluctant to undertake it and did not know if he had the time. The proper mode of approach was to bring a plan or some ma-

terials or a little job partly done and ask him what was the best way of doing it or how it could be improved. Then Collins would inspect what was essentially the lure, look at it alternately over and through his half-lens glasses, make varied comments and suggestions, and always end by remarking that he was busy at the time, but that if the particular thing were left with him, he would see what he could do with it. Invariably in a brief spell, the job was completely and ingeniously finished.

In addition to being a skilled worker in most of the ordinary types of trades and an expert technician, Collins was an accomplished photographer, an artist in preparing and mounting herbarium specimens, and not unhandy with pen and pencil.

Personally, Collins was a delightful soul. He was quiet, modest, reserved, but very kindly and companionable. He was of even disposition, the kind that "wears well". He knew when to speak and when to listen. He possessed a humor that was twinkling rather than sparkling. He had a remarkable memory for names, places and facts. His sagacious and practical advice was always comforting as well as enlightening. He was abstemious and spartan in his own life, but nevertheless possessed a personal warmth that was often unsuspected. He was endowed with Yankee "horse-sense". He viewed life philosophically, and passed through his long, last illness with patience and courage, calmly awaiting the end which he foresaw ten years ago.

There passed a MAN, one of unquestioned ability, attainments and culture, who chose to avoid the swirl of complicated modern existence and to live as a quiet botanist.

Brown University.
Providence, Rhode Island.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXL

INCIDENTS OF FIELD-WORK WITH J. FRANKLIN COLLINS

M. L. Fernald

(Plates 696–707)

Fifty years ago, in late July and early August of 1892, I made my first field-trip with Frank Collins or, as he always signed himself, J. Franklin Collins[1]. He then invited me to join him and a group of his cousins and friends at the old Collins home in North Anson, Maine, whence we started for several days of camping, trouting and botanizing, making two chief sojourns, one on the shores of the Kennebec at Carratunk, the other above The Forks, in Carrying Place Plantation, at the mouth of Dead River. The very names, long seen on maps, Carrying Place and Old Military Road, survivals from the time of Arnold's futile and costly expedition up the Kennebec, thence via the Dead River to Quebec in the American Revolution, thrilled my boyish imagination. My earlier botanizing had always been within walking-distance of home and, having a keen interest in plants which I had been forced to follow alone, it was a wonderful new experience to be with an older and kindly companion to whom I dared speak in the peculiar language which I had previously been able to share with few others. While the various cousins and friends enjoyed the out-of-doors activities of a camp in the woods, Collins and I made the acquaintance of many plants which I had never seen near Orono, and I quickly recognized that I was with a friend of unusual sincerity, modesty and skill. Quiet, undemonstrative, of few words, sensitively sympathetic, always with a quiet, dry humor, a master of woodcraft, mechanical technique and specimen-making, he gave me the companionship and help I had yearned for; and for 32 years it was a very exceptional summer which did not find us exploring or camping and botanizing somewhere in New England or the Gaspé Peninsula, our last trip together being with the party which went to the Mt. Logan region of Gaspé in 1923.

[1] James Franklin Collins, b. North Anson, Maine, December 29, 1863; d. Providence, Rhode Island, November 14, 1940. For biographical appreciation see Walter H. Snell in Rhodora, xliv. 93–97 (1942).

Our first considerable expedition was in August, 1896, when, accompanied by the late Professor William C. Strong of Bates College and my young brother, the late George Bancroft Fernald, we hired the old-fashioned stage-coach of the North Anson-New Portland route, as a commodious vehicle for camp-equipment, presses, paper and foodstuffs, and drove across to Dead River Plantation, there to get at Mt. Bigelow, then on to Flagstaff and back under the western slope of Bigelow. That trip gave us our first sight in Maine of *Prenanthes Boottii* and some other montane species previously known in the state only on Katahdin, and it strongly cemented a friendship.

Collins was a conscientious keeper of records. Several of his diaries, always literally kept up by an entry, no matter how adverse the conditions, at the end of each day, were designated by him shortly before his death to come to me, along with his invaluable volumes of photographs taken on our many trips together. These have been supplemented by many botanical notes received either by me or by the Gray Herbarium from his sister, Mrs. Edith Jenckes. The diaries are explicit and they followed an almost unvarying pattern. There are no frills; all sentiment and emotion are omitted. The simple framework is there, upon which, as he afterward reviewed them in his late years of enforced inactivity, he greatly enjoyed mentally filling in the abundant unrecorded but vividly remembered details. With characteristic caution he refrained from setting down off-hand identifications of plants seen or collected each day; until they had been studied that would have been unwise. I am, therefore, in the following notes, using Collins's framework and, whenever they might be of interest to other botanists, supplying some of the identifications he withheld. The first few excerpts are quite typical of the whole series, beginning with the Mt. Bigelow trip of 1896 and closing with the Mt. Logan expedition of 1923.

"August 13, 1896, . . . Fair and not quite so warm. Slept well last night and got up about 5.00 A. M. . . . The Fernalds went collecting along the river and a little later Professor Strong followed them. I stayed about camp and fixed it up. Had pickerel, fried sweet potatoes, oatmeal, cocoa, etc. for breakfast . . . About 5 P. M. a very heavy shower accompanied by much wind passed over. We all had to take hold of the tent to

prevent its blowing away—three of us outside and one inside. It came up so suddenly that we had no time to pick up a pile of driers, and the last we saw of them they were sailing through the air one or two hundred feet above the ground in the direction of Dead River. We did not bother to chase them up. Rain fell most of the evening. All of us were very wet below our rubber coats, and the tent was badly ripped in two or three places." Characteristically, there is no statement that only through his personal skill and forethought in meeting the emergency did we have any shelter through the remainder of the trip, for it was he who had brought first aid for an injured tent.

Still briefer the following, ten years later, while ascending Rivière Ste. Anne des Monts in Gaspé, on the way to Mt. Albert.

"August 6, 1905, Sunday. Cloudy and hazy. Spent all day on the river, going from Marten River Camp to Main Camp, a short distance below the Forks. Hard poling". (Plate 701, fig. 1).

"August 7, 1905, Monday. Rain last night and most of the day. Toasted driers before fire and fixed up camp to protect against rain. Coté caught some trout [the large sea-trout, running up the river] and shot two ducks. Breakfast of potatoes, coffee, etc. Dinner of trout, duck, tomatoes, etc."

A little more detailed the entry for

"August 8, 1905, Tuesday. Clearing somewhat last evening and cooler. Broke camp about 9:00 A. M. and got ready to go up the mountain. Left camp near the Forks of the Ste. Anne River about 9:40 A. M. Fernald and I carried small packs, camera and collecting boxes. We went up over a near-by ridge and then down through a ravine, then up the mountain, stopping every ten minutes for a rest. Coté, the two Gagnon boys, and Joe Fortin carried heavy packs. We reached an altitude of 3250 feet about 1:30 P. M. and decided to camp there. Coté, Fernald and I stayed up the mountain; the rest of the men went down to the river-camp. About 3 P. M. Fernald and I went higher up the mountain, botanizing, and left Coté to fix camp. He came up the mountain later". The remarkable discoveries on this trip will be later considered.

In the summer of 1900 Collins was a member of the Mt. Katahdin Expedition, described in some detail in Rhodora for

June, 1901 (iii. no. 30). The other members of the party, besides Collins and me, were much older and, consequently, somewhat less active amateurs, the late Judge Joseph R. Churchill,[1] Dr. George Golding Kennedy[2] and Emile Francis Williams.[3] It naturally fell to the lot of Collins and me to work together over the more precipitous and less accessible areas. Returning to camp we put up the better material, throwing the remnants outside the cabin. This refuse-pile accounts for some of the labels of Emile Williams, now preserved in the Gray Herbarium or in the herbarium of the New England Botanical Club: "Collected by J. F. Collins and M. L. Fernald, recollected by E. F. W." Judge Churchill, who prided himself on never putting into his personal herbarium any specimen which he had not himself collected, could not be induced to share our *Saxifraga stellaris*, var. *comosa*, *Epilobium alpinum* L. (*E. anagallidifolium* Lam.) and other specialties. He looked longingly at the abundant material we brought in but it never went into his herbarium.[4]

As a result of the Katahdin trip Kennedy and Collins recorded 23 bryophytes new to Maine, one of them the first known except in Eurasia; and 18 vascular plants were recorded as new to the

[1] See C. H. Knowlton in Rhodora, xxxvi. 1–7, with portraits (1934).

[2] See Emile F. Williams in Rhodora, xxi. 25–35, with portrait (1919).

[3] See B. L. Robinson in Rhodora, xxxiii. 1–18, with portrait (1931).

[4] Only once in my experiences in the field with Judge Churchill did he partly yield to temptation. Then, when he, Williams, Collins and I were in the gorge of the Aroostook River, he sought without success for any *Woodsia alpina* within his reach. Finally, in despair, he consented to lean over and allow me to stand on his shoulders (supported by the cliff) to get some of the plants which, collected with his aid, he felt justified in preserving! Another incident indicating the uncompromising loyalty to principle of Judge Churchill may be noted. When he was asked to join the Katahdin party, to be gone beyond the reach of the outside world, he had grave doubts. Through many years of married life he had never been away from Mrs. Churchill; she had always accompanied him on his trips. Finally Mrs. Churchill persuaded him to go with us, since he could write her a daily letter. This he consented to do, often to the extent of a long evening by candle-light or by staying in camp while we were away botanizing. The Judge specially paid one of the guides daily to take his letters fifteen miles toward the railroad to a "depot-camp," whence they might be picked up and delivered at a post-office. When, finally breaking camp and starting home, we reached the "depot-camp", there were all twenty fat letters on the window-sill. The Judge delivered them in person. Still another non-botanical incident of this trip, which was not recorded in the "Katahdin number" of Rhodora, concerned Dr. Kennedy. Always a Scotchman, he feared that the guides might forget to stock up with oatmeal. He, therefore, went to S. S. Pierce in Boston and ordered a five-pound box sent in care of the head-guide. When, after reaching Camp Kennedy, by Chimney Pond on Mt. Katahdin, Dr. Kennedy hopefully unwrapped the box from S. S. Pierce, he found five pounds of confectionary with a gentleman's card. Imagine the feelings of the lady with five pounds of uncooked oatmeal and a memorandum in a strange man's writing!

state, one of them, *Carex katahdinensis*,[1] new to science and subsequently found only twice, once in east-central Newfoundland, once on Lake St. John at the head of the Saguenay in Quebec.

In subsequent years Collins and I were much in Aroostook County, Maine; and in the summer of 1904 we had our first trip together to the Gaspé Peninsula. I had been on the Grande Rivière in southeastern Gaspé with the late George H. Richards and the late Lewis Cabot, who was then owner of the seigneurie, lured there by the discovery by Mr. Richards of a new *Comandra*, *C. Richardsiana*, and a wonderful series of *Anemone*, *A. multifida*, forma *polysepala* and var. *Richardsiana* and *A. riparia*, forma *rhodantha*, and other plants I had never encountered. The brief trip there in late June had yielded my first *Cystopteris montana* (Lam.) Bernh.; *Carex concinna*, *Sisyrinchium montanum*, *Osmorhiza obtusa* and *Valeriana septentrionalis* Rydb., all of the Rocky Mountains; and three undescribed species, *Antennaria appendiculata*, *Arnica chionopappa* and *Taraxacum Longii*, the two latter subsequently found in western Newfoundland. Such discoveries, made in limited spots (when and where there was good salmon-fishing) whetted my appetite and, hurrying back to a meeting of the Josselyn Botanical Society at Fort Kent, in northern Maine, I looked forward with restlessness to returning with Collins to the region. From the train, on the trip to northern Maine, I was thrilled by the precipitous headlands and cliffs which suddenly came into view, centering on Bic in Rimouski County, Quebec; the return to Grande Rivière was, consequently, delayed.

Collins's diary for the summer of 1904 records a very diversified season of discovery.

"July 6, 1904, Wednesday (Bangor—Fort Kent, Maine). Breakfast at 6 A. M. at the Bangor House. Went to Fort Kent on the 7:10 A. M. train, arriving there at 3:40 P. M. On the train were some twenty people going to the meeting of the Josselyn Botanical Society, including the Misses Hunter [now Mrs. Clarence H. Knowlton], Louise H. Coburn, Mary Clark, Sarah Brooks, Elsie L. Shaw, Nellie F. Mansfield, Dora H. Moulton and some I did not know, and the Messrs. W. L. Powers, Clarence

[1] The authors of species in Gray's Manual are omitted. When species and varieties not in the manual are mentioned their authors are noted, except those published by the writer; these may be assumed.

H. Knowlton, W. F. Stubbs, Dana W. Fellows, Ora W. Knight and a few more." . . . .

"July 7, 1904, Thursday (Fort Kent). Clear; got up at 5 A. M. and worked on mosses and helped Fernald [with his large collection from Grande Rivière, spreading and picking up driers and otherwise making himself unselfishly helpful, whereupon he was nicknamed by the ladies 'the faithful Collins']. After breakfast a party of twenty-three or -four started on a trip to St. Francis. We rode up the south side of the river, stopping occasionally to botanize." Along the St. John a *Viola*, then new to science, *V. novae-angliae*, was flowering and Miss Shaw made one of her wonderfully accurate water-color drawings of it, now in the Gray Herbarium.

"July 8, 1904, Friday. Clear. . . . In the P. M. Fernald, Dr. [George Upham] Hay, the Misses Brooks and Shaw and I walked down the bank of the St. John River botanizing", among many striking species getting the newly discovered and thus far quite endemic *Carex Josselynii* (Fern.) Mackenz., just as, a few years earlier, almost the same party, with the addition of the already venerable John Macoun, had collected at Fort Fairfield the equally local (endemic) *C. elachycarpa*.

"July 11, 1904, Monday. Cloudy, rainy in the P. M. Had breakfast at 6 A. M. at Dicky House. About 7:30 A. M. Miss Brooks, Miss Shaw, Dr. Hay, Fernald and I crossed over to Clairs, New Brunswick, and went on the 8:30 Temiscouata train to Rivière-du-Loup. The scenery is very fine, the railroad following down the St. John to Edmundston, then up the Madawaska to beautiful Lake Temiscouata [by the English-speaking people called 'Tommysquatty']. Had dinner at Notre Dame du Lac. [Collins omitted to state that the ride was so jerky and heaving that everyone was miserable or worse, so much so that, as we slowed down on approaching Notre Dame du Lac, a sufferer, looking out at the signs, caused a refreshing ripple of laughter as he disconsolately said 'Notre damn de luck']. Reached Fraserville (Rivière-du-Loup station) about 4:30 P. M. and went to Hotel Bellevue at R.-du-L. Point". The next days were spent in botanizing on the always fascinating shores of the St. Lawrence from the Point to Cacouna, always with the wonderful view across the broad river (there about 13 miles wide) of the

Laurentides. Miss Shaw, working until dark and again from dawn to breakfast-time, was kept over-busy drawing the many plants new to her, *Zigadenus glaucus* Nutt., *Cornus suecica*, *Pedicularis palustris* and many others—her paintings now a prized possession of the Gray Herbarium; while Collins and I were discovering the then undescribed *Puccinellia lucida* Fern. & Weath. and other choice species.

"July 15, 1904. Friday. Fair. . . . At 12:30 P. M. Fernald and I rode to the Intercolonial Railway station and came to Bic (Ste. Cécile du Bic). Walked to the Canada Hotel (proprietor Michel Pineau) and got rooms." Our days at Bic were very full; there seemed to be no limit to the novelties. *Woodsia oregana* at our first eastern station; *Cystopteris fragilis*, var. *laurentiana* Weath., then a novelty; *Ruppia maritima*, var. *intermedia* (Thed.) Aschers. & Graebn., at the first North American station east of the Pacific states; *Puccinellia laurentiana* Fern. & Weath., then an undescribed species; *Calamagrostis purpurascens* R. Br., at the first station known in eastern North America; *Cerastium beeringianum* Cham. & Schlecht., a characteristic and very distinct species of northwestern America; *Draba minganensis* (Victorin) Fern., then an undescribed species; *Arabis Holboellii* Hornem., typical (Plate 696, fig. 1), at our first station in the East; *A. Holboellii*, var. *Collinsii* (Fern.) Rollins (Plate 696, fig. 2), then quite new but subsequently found in the Rockies; *Saxifraga cespitosa* L., a "typus polymorphus" of the Arctic; *Potentilla nivea*, also arctic; the new × *Geum pulchrum* a strikingly handsome hybrid of *G. macrophyllum* and *G. rivale*; *Antennaria subviscosa*, representative of localized species of Greenland, Newfoundland, the Rocky Mountains and Patagonia; and numerous others quite new to us and very thrilling. Recent burns, too, were brilliant with masses of the strawberry-like fruits of *Chenopodium capitatum*, the drooping large white and yellow petunia-like corollas of *Leucophysalis grandiflora* (Hook.) Rydb. (Plate 699, fig. 1), or with *Corydalis aurea*, *Dracocephalum parviflorum* or the western *Senecio indecorus* Greene; while ferns, such as *Woodsia alpina* and *Dryopteris fragrans*, var. *remotiuscula* Komarov (Plate 697, fig. 1), and orchids, such as the Cordilleran *Goodyera decipiens* (Hook.) F. T. Hubbard, were so very abundant that we almost tired of them. To us

Fig. 1 (upper): Arabis Holboellii.
Fig. 2 (lower): Arabis Holboellii, var. Collinsii.

FIG. 1 (upper): DRYOPTERIS FRAGRANS, var. REMOTIUSCULA.
FIG. 2 (lower): POLYSTICHUM MOHRIOIDES, var. SCOPULINUM.

New Englanders this was a new world (a bit of Cordilleran America transplanted into the East); and the botanical fascination of the region, added to the scenic rarity which has so long attracted colonies of artists there, made it difficult to leave. We could not forget, however, that we were really on the way to Gaspé and that we had an appointment to meet Arthur Stanley Pease at Carleton on the Baie des Chaleurs.

"July 24, 1904, Sunday. Warm. Had breakfast at 7 A. M. and at 8:15 A. M. started for Tracadigash Mountain. . . . We ascended to a point about one half mile west of the main peak and thence along slowly [because stopping to collect *Collomia linearis* Nutt. of western North America; *Carex praticola* Rydb., at its second station in eastern North America; the always fascinating *C. Backii; Clematis verticillaris* in solid tangles; and *Poa Canbyi* (Scribn.) Piper, at its first (but not the last) known eastern station] to the summit, which is surmounted by a large wooden cross. . . . The aneroid showed 1930 feet above sea-level. Pease and Fernald worked along the base of the cliff, finding several interesting plants [*Polystichum Lonchitis, Hackelia americana* (Gray) Fern., at its first known station in the East, etc.]. I worked along the top of the cliff, going down occasionally on the alpine rope to collect."

As I have said, Collins was reticent and undemonstrative; incidentally, in a French-speaking country he was inclined to let others do the talking. It was, consequently, a complete surprise, at breakfast one morning at Carleton, to hear his bilingual pun. He suffered from dyspepsia and regularly had his cup of hot water at the beginning of breakfast. His conventional greeting to the waitress every morning included "de l'eau chaude, s'il vous plait." On the morning I refer to the porridge had been eaten, then there arrived the fish and toast and my cup of coffee, with glasses of milk for Collins and Pease. Without cracking a smile Collins quietly remarked: "There seems to be a great deal of de lait about de l'eau. In Providence it is often the other way 'round". One expected such things from Pease, but never from Collins!

For this day the diary proceeds: "Worked until 10:30 A. M. on plants and then Fernald, Pease and I started for the cedar-swamp on the road to Tracadigash Mountain. After we had

botanized there an hour or more a heavy thunderstorm passed over. I happened to have an oil-coat with me but Fernald and Pease did not have any; so they removed their clothes and put them in their waterproof rücksacks during the half-hour shower. They said the big drops felt like hail-stones and they were numb with cold, but after the shower they had dry clothes to put on."

After Carleton came the Little Cascapedia River, one of the most fascinating of Gaspé streams, with gravel-flats carpeted with miles of the trailing shrub, with great plume-like heads of fruit, *Dryas Drummondii* Richardson of the Canadian Northwest; with thickets bordered by *Astragalus frigidus* (Richardson) Gray, var. *gaspensis* (Rousseau) Fernald, closely related to a Cordilleran variety, or with the Cordilleran *Lonicera involucrata*. On the gravels we also got the Rocky Mountain *Sisyrinchium montanum* and the then new *Solidago graminifolia*, var. *septentrionalis*. The calcareous cliffs crowded closely down to the small river, and we were delighted to get characteristic *Parnassia Kotzebuei* Cham.[1] (Plate 698, fig. 1), another northwestern plant, and other species quite new to us.

Compared with the Little Cascapedia, the Bonaventure, which we next ascended, is a large river, with extensive tidal marshes at its mouth. Here we got the very distinct *Juncus balticus*, var. *stenocarpus* Buchenau & Fernald, a new variety, not yet known away from the Gulf of St. Lawrence; *Stellaria crassifolia*, a species which in the East is concentrated about the Gulf; and the new halophytic *Bidens hyperborea* Greene, var. *gaspensis*. Up-river, slightly below the carpets of *Dryas Drummondii*, there were great areas of *Epilobium latifolium* L., Plate 698, fig. 2, a depressed arctic-alpine perennial with thick, gray foliage, and flowers two or three times the size of those of *E. angustifolium*. In springy spots *Carex media* R. Br. (*C. angarae* Steud.) of Asia and northwestern America was new to the East; the then undescribed *C. Garberi*, var. *bifaria* (Gaspé

[1] *Parnassia Kotzbuei* was wholly new to me. When I reached Cambridge with our collections the late Dr. Rydberg was visiting the Gray Herbarium. I showed him the *Parnassia* and he promptly replied: "That's a new species. I have just finished the genus for the North American Flora. Why can't you and I publish this new one there?" I forthwith studied the genus and found that our plant was the well known Alaskan species of Chamisso. In this study, however, I found a very distinct novelty, collected in Montana by Rydberg. This, the only species I share with him, was published as *P. montanensis* Fern. & Rydb. in the North American Flora, the only time I was ever invited to contribute to that variegated work.

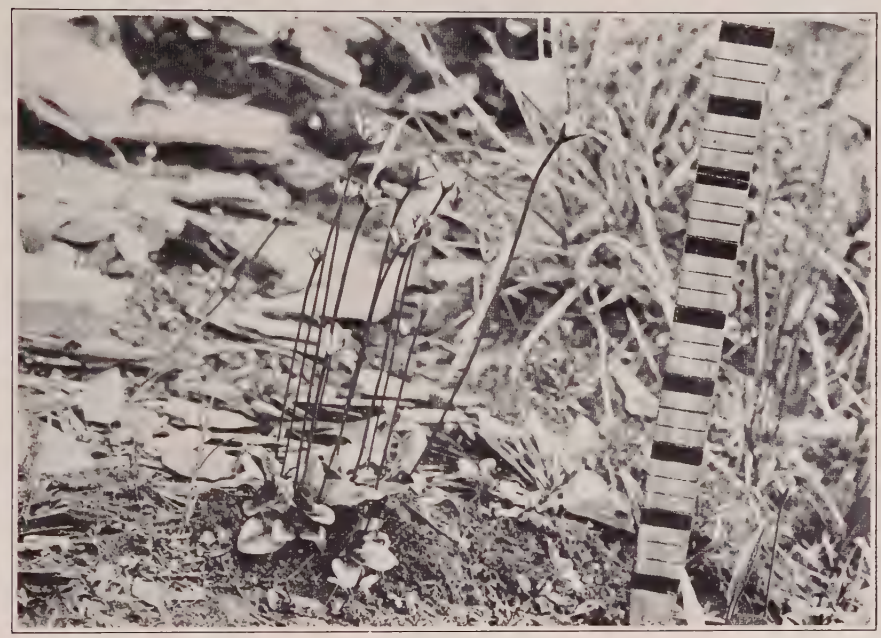

Fig. 1 (upper): Parnassia Kotzebuei.
Fig. 2 (lower): Epilobium latifolium.

Fig. 1 (upper): Leucophysalis grandiflora.
Fig. 2 (lower): Salix vestita.

to northern Maine; southern Alberta and British Columbia), and the new *C. flava*, var. *gaspensis*, were abundant, while dripping ledges were yellow with *Saxifraga aizoides*, with *Anemone parviflora* frequent. On calcareous slopes *Dryopteris Robertiana* (Hoffm.) C. Chr. abounded. Our very brief visit to the Bonaventure gave good evidence that detailed exploration would yield fine results.

Travel on the Baie des Chaleurs by steamer is a special art. Witness the record.

"August 10, 1904, Wednesday. Clear. Had breakfast at Bonaventure about 7:30 A. M. At about 8 A. M. or a little later our baggage was carried up the beach a short distance and left at a store for transportation to the steamer 'Admiral' when she or he came. When the 'Admiral' appeared in the distance the tide was so low that the regular lumber-boat which carried passengers and baggage out to the steamer could not be floated; so two whale-boats were hauled by horsepower out to deep water, luggage was hauled out to one, and the passengers, some eight in number, were hauled to the other. Both boats were then rowed out to the path of the 'Admiral'. . . . At Newport, l'Anse au Gascon, and Grand Pabos lumber-boats came out to meet the steamer—at the last place there was a heavy sea and the transfer of freight and passengers was exciting . . . arrived at Grande Rivière at 7:00 P. M."

We landed at Grande Rivière because it was important to get up-river in late summer to explore in more detail the shores which, in June, had yielded so many novelties. The owner, Mr. Cabot in Boston, had given me authority to employ one of his officials, since it would now be close time on salmon-fishing and the man would be at our command. Unfortunately, Mr. Cabot, then far from Grand River, did not realize what we soon discovered; his faithful employe was up-river in the employ of various county officials enjoying forbidden fruits! Repeated calls at the official residence proved futile and our only botanizing on the river was near its mouth. There, however, we got the then undescribed and very local and endemic *Salix paraleuca*. Lingering for a few days, always hopeful that we might yet ascend the river, we utilized the time to some advantage. Near our temporary home there was a marl-bog, full of such charac-

teristic plants, already familiar to us, as *Carex chordorrhiza, C. livida*, var. *Grayana* (Dewey) Fernald, *Juncus stygius*, var. *americanus* and *Orchis rotundifolia;* but the Rocky Mountain *Salix myrtillifolia* Anders. was a novelty, as were *Drosera linearis* and *D. anglica*, the beautiful little red-flowered *Rubus acaulis* Michx. and its relative, the then undescribed *R. peracaulis* Bailey (of northwestern America). At another boggy spot, the margin of Marl Pond, we discovered the then quite new little *Galium brevipes* Fern. & Wieg., a species subsequently found by Dr. Porsild in Greenland; and the limy pockets yielded the type-collection of *Drosera rotundifolia*, var. *comosa*, plants with the flowers altered to clusters of leaves, these dropping off and rooting. The exposed bluffs along the outer Bay had a dense tangle of *Aster*. From this assemblage we extracted the original collections of *A. foliaceus* Lindl., vars. *crenifolius* and *subpetiolatus*, plants endemic on the Gaspé Peninsula. Finally, realizing that our canoeman had no intention to come for us, we moved on. Later, at Gaspé Basin, we met some of the poachers who took evident delight in having thwarted us Yankees.

"August 16, 1904, Tuesday. Mostly clear. In the early A. M. we worked on the plants and then packed trunks. Started from Grande Rivière about 9:30 A. M., our baggage on one wagon, and Rupert driving the other with us. About noon we stopped at Cape Cove for dinner. Later we started for Percé where we arrived about 4:00 P. M. We tried four different places before we found a single room, at Mme. Traché's." [This room, heavily musked and liberally hung with Mme. Traché's clothes and the inevitable sacred pictures and ornaments, with one feather-bed, screened by very thick curtains, the window tightly nailed against possible opening, was the home and workshop for three men. At night we matched pennies to decide which of us would have the good luck to sleep on the floor, which would accommodate only one.] "After supper [of parboiled beans] and unpacking a bit we walked up on one of the headlands [Cap Barré] near the house, doing some botanizing": *Cerastium beeringianum*, var. *grandiflorum* (Fenzl) Hultén of Alaska and northeastern Asia; *Draba incana* L. and its var. *confusa* (Ehrh.) Poir., the first from so far south; the new *D. pycnosperma* Fern. & Knowlton, a beautiful little species endemic on outer Gaspé and in western

Newfoundland, the plant Emile Williams, when he collected it a year later, suggested as the appropriate emblem, on account of its name, for the Society for the Protection of Native Plants; the arctic *Saxifraga oppositifolia* and *Arenaria rubella* (Wahlenb.) Sm.; and the types of the nearly endemic *Solidago lepida* DC., var. *molina* and of *Senecio pauperculus* Michx., var. *firmifolius* Greenm. That was a brilliant start and we tried to overlook the deficiencies of hotel-accommodations, complete lack of modern sanitary and toilet facilities, and improper food. These could not be wholly ignored, however, for we all suffered from pretty acute indigestion and, when we had had parboiled beans for three successive days and I asked our hostess for something more digestible, we came in to a supper of heavy French pancakes. Mme. Traché's father, a fisherman who spoke English, sat at table with us, and noticing that our physiological adjustments were not like his own, encouraged us by frequently urging: "Eat hearty, fellers. Men can't work the way you do without eating hearty." Our own supply of educator-crackers, raisins and chocolate kept us going and when, after getting back to Cambridge to recuperate, I was promptly sent to the Stillman Infirmary to have my inflamed appendix out, I was thankful that the operation had not been done by the fishermen at Percé!

"August 17, 1904, Wednesday. Foggy and rainy all day. After breakfast we worked a while on the presses, then put on our waterproof clothes and botanized on the crags northwest of the house and about the waterfall in the ravine (La Coulée) until noon. After dinner . . . collected along shore to and around the lighthouse at White Cape. Here Fernald had the alpine rope looped around his shoulders and walked along the treacherous and crumbling edge of the cliff while Pease and I held the other end of the rope some distance away from the cliff. Got home at 6:30 very wet." The day had been so foggy and rainy that many flowers were beautifully expanded, others as conspicuously closed. We specialized upon *Euphrasia*, bringing back *E. arctica* Lange, *E. rigidula* Jordan, *E. tatarica* Fisch. and *E. americana* Wettst., and some not easily settled. Small boys followed us wherever we went, always anxious to help the "doctors" gather their herbs. They were specially fond of bringing us bulbs of *Zigadenus glaucus*, with the explanation that

"it's a horrible thing for the guts"; in view of the toxic properties of the genus, reflected in its western name "Death-Camass", we did not try it.

"August 18, 1904, Thursday. Fair a little while in the A. M. during which we partially dried driers, etc.; later alternately rainy and fair . . . at 12:30 P. M. we all went up Mt. Ste. Anne to the shrine, botanizing both going up and coming down. Used the rope considerably about the summit [collecting the type-material of *Antennaria gaspensis* and many other fine species]. Took some pictures (Plate 700, fig. 1) from the summit when the clouds and rain would permit." The last modest statement was tyical of Collins's almost puritanic dread of expressing emotion. He was keenly appreciative of the unique beauty and grandeur of the Percé landscape, verbally became very enthusiastic, and throughout this and all other trips with me spent as much time on photography as on botany. His negatives from Gaspé ran into the thousands. The tops of the balsam firs, *Abies balsamea,* here presented a strong contrast with firs as we knew them generally. Upon material from Mt. Ste. Anne I based my var. *phanerolepis.* An incident on the trail well illustrated the mental subservience of these people. Looking out to the northeast, we saw a long and low land, obviously Anticosti. When we met the priest with a workman, who was repairing the trail to the shrine, by way of conversation we pointed to the distant island and asked, "Is that Anticosti?" The workman promptly replied, "Oui, oui, Anticosti", but his master said, "No, you can't see Anticosti from here", whereupon the man corrected himself: "Non, non, ce n'est pas Anticosti."

The diary continues until our reaching Boston on September 2nd. From Douglastown we went a very short distance up the Douglastown and from Gaspé Basin an equally short distance up the Dartmouth River. We could get no canoes and had to be content with heavy lumbermen's bateaux, solid and very slow. Our discoveries were, therefore, relatively unimportant.

In the summer of 1905, Emile and Mrs. (Blanche) Williams and Mrs. Williams's friend, Miss Mary Waring, joined us for a trip over the same route, through Williams's July vacation, and Mr. and Mrs. Oakes Ames were with us for a brief trip up the Grand Cascapedia. Since the specialties have been so thoroughly

Fig. 1 (upper): Percé from Slope of Mt. Ste. Anne (Rocher Percé near middle; Bonaventure Island in distance, at right).
Fig. 2 (lower): Gannets nesting on Ledges of Bonaventure Island.

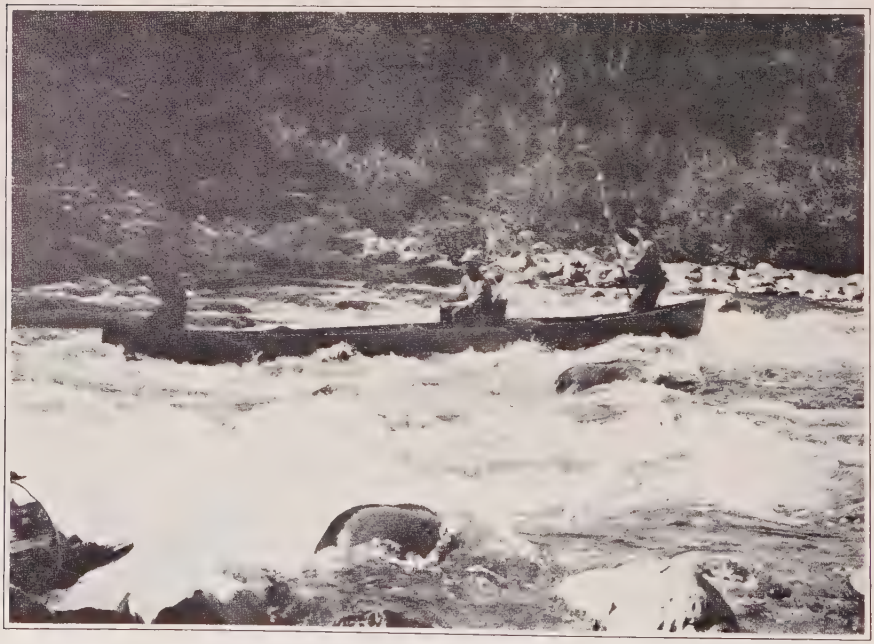

Fig. 1 (upper): Hard Poling.
Fig. 2 (lower): Collins (center) enjoying Life.

covered in the notes for 1904 only a few items for July need here be noted.

Botanically the Grand Cascapedia is relatively uninteresting. The plants which make the Little Cascapedia a joy are largely wanting. At Percé we had superior quarters at the fine old house of M. Le Boutillier, the elderly head of large fisheries and of large stores. One of Collins's entries records a notable new station near Percé.

"July 25, 1905, Tuesday. Cloudy, foggy and rainy. We all spent the A. M. in taking care of plants collected yesterday. In the early P. M. we went by team to Grande Coupe. Mr. and Mrs. Williams botanized along the bases of ridges and Miss Waring, Fernald and I went up the cliffs and around to the next 'coupe' to the westward. We got some nice things, *e. g. Dryas integrifolia* Vahl, *Salix vestita* Pursh (PLATE 699, FIG 2) *Polystichum Lonchitis*, *Corallorrhiza striata*, etc. [including the arctic-alpine *Carex rupestris* All., the new *Salix Bebbiana*, var. *capreifolia* and the tiny *Thalictrum alpinum* L.]. Got back about 7:00 P. M. very wet. Had a fine supper."

That "very wet" day on the dripping ice-cold cliffs of Grande Coupe laid Collins and me off with intestinal disturbances and hard colds, which did not soon vanish. Consequently, after the Williams party had sailed for home, we took the steamer "Gaspésien" from Gaspé Basin to Mont Louis on the north coast of the Peninsula, picking that village out as likely to have proper food and as being the center of precipitous limy walls, which fascinated us. Collins's brief entry only partly tells the story.

"July 31, 1905, Monday. Clear. Got up on str. 'Gaspésien' at about 4:30 and went on deck. Stopped there most of the A. M. enjoying the scenery [and taking many photographs]. Reached Mont Louis and went to the bargeman's house [one Bouchier, a piratical giant with ragged black beard and great projecting tusks, who, when we asked for the hotel, replied, 'I have the hotel', not divulging the spick-and-span house, with fine food, run by Fred Au Clair, which, of course, we knew nothing about. Dinner consisted of bread and butter, tea and chunks of salt pork, floating in grease, not the best food for our condition; our room was a bit of unfinished loft, without window, and reached by a ladder from the kitchen and living-room. We were not

enthusiastic to remain there]. In the P. M. and again in the evening we walked out and examined the cliffs, etc., for plants. Did not seem to find a single characteristic plant and we were much disappointed. [Showing how completely mental and physical discouragement control the outlook. In 1923, when, under better conditions, a party botanized about Mont Louis, and in 1931, when, with Mr. and Mrs. Charles A. Weatherby and my daughter and son, I spent some days there, it was difficult to break away from the fascinating cliffs and slopes, which support such treasures as *Carex misandroides*, endemic representative here and in western Newfoundland of the rare Canadian Rocky Mountain *C. Franklinii* Boott; *Draba lanceolata* Royle, of Asia and western North America; the endemic *Astragalus scrupulicola* Fern. & Weath., eastern representative of the western *A. aboriginum* Richardson; and *Oxytropis gaspensis* Fern. & Kelsey, endemic eastern representative of the Rocky Mountain *O. viscida* Nutt.; *Erigeron compositus* Pursh, var. *trifidus* (Hook.) Gray, at its first known station south of the Arctic and east of the Rockies, and scores of non-endemic specialties. On July 31, 1905, Collins and I were glad to think Mont Louis a poor spot.] Talked of driving to Ste. Anne des Monts but no one would undertake to haul our trunks there over the rough and hilly roads. Later decided to go in a barge [lobster-boat with decayed fish smearing the whole inside]."

"August 1, 1905. Tuesday. Cloudy, windy and cold . . . Started about 8 A. M. in a barge with M. Bouchier and another man [fare 'dix piastres'] for Ste. Anne des Monts. We were practically becalmed for an hour near Pt. de Chasse. Reached Ste. Anne des Monts about 4:30 P. M. nearly frozen. Went into LeMontagne's store and talked with him about boarding places, eating, etc. He recommended Ed. Lefrancois' place." Supper consisted of "bifstek", carrots, baked potatoes, lettuce, graham bread, a choice of 23 kinds of relish and condiments, massed at the center of the table, pickled beets, cake and cherries! We immediately forgot that we were desperately ill and when, after supper, Lefrancois asked "Are you going in to Mt. Albert?" we woke up, "just like that" and said, "Why, this is where you start for Mt. Albert, isn't it?" In half an hour the famous guide and hunter, Sam Coté, was with us, planning the trip, to start as soon as possible. That shows what proper food will do!

"August 3, 1905, Thursday. Cloudy and foggy in the A. M. Clearing in the P. M. Clear with aurora borealis in the evening. In the A. M. spent most of the time in getting ready to go up river. Had Lefrancois haul our baggage down to the river after dinner and about 1:30 P. M. we started up-river, with Fernald and part of the luggage in one canoe, I and the rest of the baggage in another. The river is a rather rough one and we went up about one hundred feet in the first nine miles. Here we stopped for the night at Col. Starkey's lower camp. Our canoemen (Coté, Joe Fortin and Hector and Edouard Gagnon) pitched tent and Fernald and I dined with Col. Starkey (owner of the salmon-fishing rights on the river). Nice dinner and pleasant chat afterward. Fernald and I in tent; the canoemen in the guides' house at the camp. From here we got our first fine view of the foothills of the Shickshock Range."

"August 4, 1905, Friday. Fair, partly clear; very warm in middle of day. We left 'Nine-mile Camp' about 8 A. M. and stopped for lunch at 11:05 A. M. While we were lunching, two men came down the river with the skin of a bear they had killed at the next Starkey camp. We camped near the head of a long and hard rapid known as 'Three-mile Rapid'; and then passed through a wild and beautiful rocky gorge (Grand Rapid), where it was very difficult to get the canoes through. Fernald and I in our lean-to tent under canopies; canoemen in another tent".

"August 5, 1905, Saturday. Cloudy and somewhat showery. Warm in middle of the day. Collected a considerable number of specimens [*Festuca prolifera* (Piper) Fern.; the new *Poa gaspensis* (subsequently found in Alaska); *Sagina saginoides* (L.) Dalla Torre, the first from east of the Rockies and south of the Arctic, *Arabis alpina*, etc.] and I got quite a number of mosses. [One of the very rare memoranda regarding the group upon which Collins was a recognized authority.] In the late P. M. we reached Rivière à la Martre (Marten River) and camped about one mile above there on a gravel-beach. Got some fine views of Tabletop Mountain. A few rods above our camp the top of Mt. Albert was seen (our first view of it) over the top of a great ridge". . . The entries for the next three days, including the ascent of Mt. Albert, were earlier copied. That for August 8, continues

"We found the nearest peak (East Peak) about 3650 feet high,

with a still higher peak to the west-northwest. To the south of these there is an immense tableland sloping gently to the southward. The eastern end of this tableland is a great serpentine rock-barren, and the western a bog or meadow. To the south of this is a deep gorge with three large snow-banks in view. Beyond this is the main (highest) part of the mountain—a still larger desolate-looking rock-barren plateau sloping gently to the main dome. We found extremely interesting plants—many of them unknown to Fernald" [*Adiantum pedatum*, var. *aleuticum* Rupr., the first from east of British Columbia; *Festuca scabrella* Torr., a characteristic plant of the arid Cordilleran region; *Danthonia intermedia* of the Rocky Mountains; the beautiful copper-colored *Eriophorum Chamissonis*, in rippling carpets; true *Carex paupercula* Michx., much smaller than the lowland varieties; a host of strange willows in prostrate mats almost solidly enmeshed in rock, the arctic *Salix anglorum* Cham. in three varieties, *S. brachycarpa* Nutt., the first from east of the Rockies, and an amazing little species for a willow, with glabrous capsules and glabrous green scales, the endemic *S. chlorolepis;* very strange species of *Arenaria*, dense masses of wiry marcescent foliage and large pink or white flowers, the new *A. marcescens*, subsequently found only on the serpentines of Newfoundland, a delicate creeping species with fine linear leaves, *A. sajanensis* Willd., elsewhere unknown in America from south of northern Labrador, and a little species with thick oblong leaves, which I described as *A. cylindrocarpa*, a species then recognized only in the Canadian Rockies and in northern Labrador, subsequently found in western Newfoundland and now united with the famous relict of northern Europe, *A. humifusa* Wahlenb.; *Lychnis alpina* L., var. *americana*, of Greenland, Labrador and western Newfoundland; *Statice labradorica* (Wallr.) Hubbard and Blake, var. *submutica* Blake, extending down from the Arctic; the only arctic goldenrod, *Solidago multiradiata* Ait., and another species, a local endemic, with vividly green involucres, the new *S. chlorolepis;* the wide-ranging *Artemisia borealis* Pallas; and the new *Cirsium muticum*, var. *monticola*. We were thrilled, pestered by black flies (to the point of repeating the guides' most frequent expression, "les sacrés mouches") and so confused by novelties on all sides that, as soon as we started to collect one, several

Fig. 1 (upper): Northern Amphibolite Slope of Mt. Albert, with Margin of Serpentine Tableland at right.
Fig. 2 (lower): Serpentine Tableland of Mt. Albert; wooded Amphibolite Area in Background.

Fig. 1 (upper): Head of Ruisseau à la Neige, Mt. Albert.
Fig. 2 (lower): Treeless Serpentine Wall north of Ruisseau au Diable, Mt. Albert.

others would divert us. The mosscarpet, too, kept Collins absorbed; and singularly enough, sharing the wet depressions in this alpine and wind-swept serpentine barren were such commonplace lowland plants as *Sarracenia purpurea, Geum rivale, Vaccinium Oxycoccus, Kalmia angustifolia* and *polifolia* and *Andromeda glaucophylla*. Yet, where we were making an amazing harvest of novelties and of common boreal herbs and low shrubs, the region was once described by one of the most famous of Canadian geologists as "absolutely destitute of vegetation". Along the western margin of the serpentine tableland a nearly straight line (PLATE 702, FIG. 2) divides it from a Hudsonian scrub-forest or "puckerbrush", the latter occurring on the amphibolite rock. So sharp is this boundary, that, given the cue, one could predict the vegetation. On the serpentine occurred the above-mentioned specialties and some more familiar plants: *Carex Bigelowii* Tuckerm. (*C. rigida* of the manuals), *Juncus trifidus, Betula glandulosa* var. *rotundifolia, Empetrum nigrum, Rhododendron lapponicum, Phyllodoce caerulea* and *Arctostaphylos Uva-ursi;* while the amphibolite or hornblendic area was as definitely marked by the abundance of *Hierochloë alpina, Carex capillaris, Luzula spicata, Salix planifolia* Pursh and *S. herbacea, Sibbaldia procumbens, Vaccinium cespitosum* and *Arnica mollis,* never or only rarely seen on the serpentine. On the north-facing slope, just below the tableland (PLATE 702, FIG. 1), the wet amphibolite below a mass of packed snow and ice was a carpet of species not once seen on the serpentine: *Lycopodium alpinum* L. of the Arctic; *Poa alpina* L. and *Carex bipartita* All., also arctic; *Luzula confusa;* the newly discovered *Streptopus amplexifolius,* var. *oreopolus* (Fernald) Fassett; *Salix cordifolia* Pursh and the new *S. hebecarpa;* the western North American and Siberian *Betula microphylla* Bunge; the arctic *Ranunculus pygmaeus* Wahlenb. and the type of *R. Allenii* Robinson, of the Shickshock Mts. and northern Labrador; *Viola palustris; Epilobium lactiflorum* and *E. alpinum* (*anagallidifolium*); *Cassiope hypnoides;* the Rocky Mountain *Vaccinium ovalifolium* and a beautiful new species, *V. nubigenum; Veronica alpina,* var. *unalaschcensis,* and *V. humifusa; Gnaphalium norvegicum* Gunn. and *Taraxacum lapponicum* Kihlm. In this typically alpine and subalpine vegetation it was amazing to find carpets

of the lowland *Chrysosplenium americanum* and to be able to supplement our limited vegetable-diet with cooked stalks of the common lowland *Heracleum lanatum*, with *Oxyria digyna* and *Arabis alpina* as salad. The contrast between the floras of the amphibolite and the serpentine was so vivid that I was stimulated to a new line of research.] Picking up the journal again: "The black flies on the mountain, especially at the summit, were something fearful and we were obliged to wear improvised head-nets (Plate 704, fig. 1) and even then there was little comfort. . . . I have never seen anything like them." . . .

"August 9, 1905, Wednesday. Spent all A. M. putting up plants collected yesterday. Were obliged to do this inside cheesecloth canopies [in a 6-foot lean-to] to keep away from 'brûlots' (midges), black flies and mosquitoes." . . .

"August 12, 1905, Saturday. . . . At about ten o'clock we all started for Snow Brook Ravine (Ruisseau à la Neige) collecting. . . . Before reaching the great snow-arch we were caught in a shower or two. These showers continued most of the P. M. At one time we got under the snow-arch to get out of the rain. The arch (Plate 703, fig. 1) was formed by the brook flowing underneath the great snow-bank and was some twenty-five feet high." Besides more willows, the great prize of the day was *Polystichum mohrioides*, var. *scopulinum* (D. C. Eaton) Fernald (Plate 697, fig. 2), the serpentine of Mt. Albert the only region for it east of Idaho.

"August 14, 1905, Monday. Snowing and hailing most of the early A. M. The temperature was below freezing in the morning and in the late afternoon 37 degrees. Slept cold last night. Tabletop Mountain, ten miles away, was covered with snow. . . . Fernald and Joe went off to the ravine to the eastward about 2:30 P. M. . . . I got back about 7:00 P. M. Temperature 42 degrees".

"August 15, 1905. Clear and cold. Got up about 3:30 A. M. on account of cold. [I well remember the greeting from Coté, in characteristic Canadian French, as I crawled out of the tent: 'Fer fret cum job' ('Il fait froid comme le Diable')]. Fernald and I worked on the plants until 10:30 A. M., when Edouard and Hector started down the mountain with large packs. About noon Fernald, Joe, Coté and I started down (Plate 704, fig. 2) . . . Flies bad."

Out on the coast, away from the freezing alpine conditions of mid-August, we explored along shore, fascinated by the giant *Senecio Pseudo-Arnica* (shared with the Bering Sea region), *Plantago eriopoda* Torr., a species primarily of the alkaline Canadian Plains, and other maritime or halophytic types. We were delighted, too, with the great areas, at the mouth of the river, of the very fleshy *Hippuris vulgaris*, var. *maritima* Hartm., a rare plant as shown by herbaria. Driving down river to Pointe Tourelle, Cap Tourelle, Rivière Patate and Ruisseau Castor, we called in to see that the type-colony of *Arnica gaspensis* was intact and spent much of the time exploring and botanizing about the remarkable natural bridges and fantastically weathered sea-stacks and tower-rocks which gave the name Tourelle. The Rocky Mountain *Woodsia scopulina*, new to the flora of the East, abounded in some of the crevices. *Draba glabella* Pursh, with the endemic lower St. Lawrence var. *orthocarpa* and the very definite var. *megasperma*, more or less alternated on the cliffs, and *Festuca* was a complicated group, with *F. rubra* often represented by the arctic vars. *mutica* Hartm. and *arenaria* (Osbeck) Fries, and the *ovina*-series by *F. saximontana* Rydb.

In 1906, vividly conscious of the sharp contrasts in the floras of the acid areas, the serpentine and the calcareous rocks, we undertook a thorough collection of typical plants and the rocks upon which they grew, Harley H. Bartlett, then a student with me, being ready to undertake the chemical analyses. Equipped with a steel frying-pan and abundant cloth bags we started in at Bic, placing the thoroughly washed plants on the hot pan and allowing them to ignite over a bed of hot coals without the use of matches. Collins entered whole-heartedly into this collecting and, already knowing much of the country to be visited, we planned to secure the samples of plant-ash, rock and soils without making many new discoveries. At Bic, of course, we got to some new territory, the ragged and castellated white cliffs toward St. Fabien (Plate 706, fig. 2), as well as Cap Orignal (Moose Cape) and some others and, inevitably, new discoveries were in order. The greatest shocks, however, were when we got back and Bartlett proceeded with the analyses. *Saxifraga Aizoon* is famous for having the large stomata along the leaf-margins heavily incrusted with insoluble calcic carbonate,

waste thrown off through the stomata; it obviously should occur on calcareous rocks. On one big cliff near Bic it was very handsome, growing on what seemed like quartzite. We accordingly got a large sample of the plant-ash and good samples of soil and rock. When Bartlett got hold of them repeated analyses showed the ash of the plant to contain a large amount of calcium, the soil and the rock to be pure silica! Rock-samples were referred to the petrographer, the late John Eliot Wolff, and he, too, said "quartzite." That was that! On the base of Cap Orignal, a headland wholly unlike those around, both in its rock and its weathering, *Iris setosa*, var. *canadensis* abounded. We consequently got good samples. When the analyses were made the ash of the *Iris* showed abundant manganese, the rock-sample only a trace. Again, there we were! Bartlett went through hundreds of samples, sometimes finding what was expected, sometimes just the opposite, and in the end, realizing that the analyses were not repeating the operations of the plants, he declined to publish the inconclusive results. In the analyses it was not possible to repeat the activities of the roots in attacking the hygroscopic film about each soil-particle nor the ability of the plant to draw alkaline salts from the fogs and mists along shore. Although *Saxifraga Aizoon* was on pure silica, the heavy fogs, apparently, supplied it with the calcium it required. All this was unknown to Collins and me at the beginning of the season and we spent many hours daily in conscientiously assembling the ash.

We had arranged in advance with Sam Coté to have the provisions all bought and packed into the Gaspé canoes (dugouts), so that we could start immediately up the River Ste. Anne des Monts. With the aid of my French dictionary we had drawn up two pages of required provisions, but on reaching Ste. Anne des Monts we found Coté and the storekeepers in perplexity. Everything was clearly understood and the supplies had been properly stowed except two: "*pommes de terre*" and "*jambon.*" Proceeding to the market we pointed out what we meant, *patates* and *becking*. *Pomme de terre* in Gaspé is the mountain cranberry, *Vaccinium Vitis-Idaea*, var. *minus*, which carpets the mountains; *patate*, the early French name, was the word brought from France by the original settlers of Gaspé. Later, after the guides

had packed more than ten miles through the woods, thence up the steep walls of Tabletop, when we suggested attacking the 20 pounds of "prunes", they got out a quart can of Green Gage Plums, mostly water; we went without the less costly and more desired *prunes sèches.*

Going this time to Ste. Anne des Monts,

"July 11, 1906, Wednesday. Started from Little Métis with Paul Marmon as driver at 7:30 A. M. Arrived at Matane (33 miles) at noon and had dinner . . . Started on again at 2:15 P. M. and reached Les Méchins at about 8:30 P. M. (45 miles), making about 78 miles from Little Métis with one horse." . . .

"July 12, 1906, Friday. Left Les Méchins about 7:30 A. M. and drove leisurely [because stopping for a good deal of botanizing, on this drive becoming much impressed with a small tree with the largest fruiting aments and the largest leaves we had ever seen on a willow, the new *Salix laurentiana,* endemic on the shores and bluffs of the Gulf of St. Lawrence and closest related to *S. Hookeriana* Barratt, of the Pacific coast from southern British Columbia to California] to . . . Ste. Anne des Monts. Found Coté and Joe Fortin there. In the late P. M. we reorganized baggage", and at 10 next morning started up-river. A disgruntled and very boastful rough-neck, whom we will call Zéphirin Violette, was at the starting-point, wildly gesticulating and assuring us that we had a miserable crew, that Coté knew nothing about the woods—in short, that we ought to have employed him. Consequently, when we stopped at noon to "boil the kettle" and found the axe gone, we knew who had removed it. One canoe was sent back to get another axe and Collins and I took off time to botanize. The next time we were organizing an expedition, the Mt. Logan trip of 1923, we received a letter, written in flowing English and a fine bookkeeping hand, from one of our former guides, urging us to take Zéphirin into the party; he was a splendid fellow and heartily ashamed of the way he had acted. Fortunately, before we could answer, the following self-explanatory message arrived:

"Wen i rot you las nite i had Mr. —— at the store in Cap Chat rite for me i axe you to hire Zéphirin Violette i had to he stood there an' made me he is a liar please rite me and say you don want nothink to do of Zéphirin Violette." We so wrote.

While waiting for the axe and during a leisurely ascent of the river for some days we watched the plants, as we had not done in the hurried trip of the year before. *Listera auriculata*, *Primula mistassinica* and *Pinguicula vulgaris* carpeted the damp slopes, usually overhung by *Lonicera involucrata;* and wherever there were spring-rills and small brooks coming in *Arnica mollis* and *Arabis alpina* L. made great displays, with the gravels bearing the usual solid carpets of *Dryas Drummondii* and *Epilobium latifolium* (Plate 698, fig. 2). All these were now quite familiar, but the goldenrod of the gravel-flats seemed strange, the Rocky Mountain *S. lepida*, var. *elongata* (Nutt.) Fern. On one wet slope the *Erigeron* puzzled us, *E. elatus* Greene of the Canadian Rockies; and, topping off breakfast one morning by picking some wild strawberries, we found ourselves instinctively neglecting the tiny ones—until it dawned upon us that they were on many-crowned and nonstoloniferous half-shrubs with tiny leaves, the unique and strictly endemic *Fragaria multicipita*. At another point, when we left the canoes in order to decrease their loads, we walked into a carpet of a strange little round-leaved willow, *Salix obtusata*, so strange that its relationship in the genus has not been made out.

This trip up-river was full of thrilling incidents.

"July 16, 1906, Monday. Cooler, 66 at 6:00 A. M. Very hazy and smoky. Not many flies to bother us last night. Used a joss stick in the canopy before going to sleep. Got up about 5:30 A. M. and had a bath in the river. Took Coté's trout-rod and caught a salmon. Coté and Joe helped me land him. [Collins omitted to state that the entire camp was roused by his shout, 'Help, help!' He had stepped into the stern of one of the emptied canoes, drawn part-way out of the water, and the fighting salmon was towing the canoe (without poles or paddles) swiftly down the Grand Rapid, when Coté and Joe, paddling with all their might, caught the speeding canoe and brought back the two heroes of the episode.] Warm in middle of the day —82 about noon. . . Saw a large Canada lynx trying to catch some ducks. Portaged past Little Sault", our station for *Salix obtusata*.

The journal of much of the Mt. Albert trip may be omitted, except to note that we had great difficulty making many of the

Fig. 1 (upper): Flys bad, on Mt. Albert (Collins, Sam Coté, Fernald and Joe Fortin, from left to right).

Fig. 2 (lower): Breaking Camp, Mt. Albert (Sam Coté and Joe Fortin).

Fig. 1 (upper): Triangular Pond, Tabletop Mountain.
Fig. 2 (lower): Across northern End of platter-like Tableland of Tabletop Mountain (Gorge of Rivière Madeleine at right in distance).

plants from the serpentine barrens ignite. They had grown on silicate of magnesium and had some of the properties of asbestos or of soapstone. On the steep and treeless north wall of Devil's Gulch (Ruisseau au Diable) we got *Pellaea densa* (Brack.) Hook., a characteristic species from southern British Columbia to southern California, here growing with the still rarer *Polystichum mohrioides*, var. *scopulinum*, PLATE 697, FIG. 2, already referred to; and in collecting them we found ourselves kneeling in a carpet of *Epigaea repens!*

From the eastern border of Mt. Albert we figured out a route from the Forks of the Ste. Anne des Monts across to Tabletop; and on the 26th Coté and Roy went down to the river-camp and started to blaze a trail to that vast tableland. In the evening of the 28th, just after we had come down to the river, the two trail-makers came in, haggard, pale and unnerved. They had been "through Hell", nearly died of thirst and were bleeding from fly-bites. "Nothing" would induce them ever to go again "through Hell". Discussion of the matter was not then in order; embracing, soothing, hot supper and bed were the best cure; and when, after a quiet Sunday, they realized that everyone at Cap Chat and at Ste. Anne des Monts knew that Coté was guiding an expedition to little-known Montagne de la Table, they decided to take us in, that we might see for ourselves. Upon leaving the river they had found old blaze-marks on trees. These they had followed, taking exactly the course we had figured out from Mt. Albert, for they had hit upon the old route of A. P. Low, who, when exploring for the Geological Survey of Canada, had also started from the Forks.

"July 31, 1906, Tuesday. Clear all day. After breakfast at the Forks we packed up our things and started at 9:00 over Low's Trail for Tabletop. It was a long, hard tramp—ten miles by pedometer. Arrived at a small lake, at the foot of Tabletop, called by Coté 'Lac des Américains', at 6:15 P. M."

"August 1, 1906, Wednesday. Had a headache in the A. M., so stayed about camp most of time. In the P. M. Fernald and I made a circuit of the lake and got some interesting plants [carpets of *Isoëtes macrospora* and of *Subularia aquatica*, etc.] Coté been up the mountain cutting trail most of the day. Joe, John and Wilfred gone down to the Forks for second load of

things. Trout abundant in the lake. In less than one hour I caught 35 trout with the ravellings from my khaki trousers as bait for the first fish, then used a trout-fin for the rest. Fernald came in to camp a little later and as a result of his hour's fishing had 36 trout, the largest being 7½ inches long. He caught all from a rock, with the fin of one fish as bait for all but the first".

"August 2, 1906, Thursday. Hazy from smoke. Spent the early A. M. taking care of plants. About 9:30 A. M. Coté, Fernald and I started up the mountain via Low's Trail, going from camp to that trail via one cut by Coté. Reached top of first spur, very dry (2970 feet) . . . From here we worked east and then north to the top of a high peak which was 3760 feet altitude. We then went north to the edge of the next ravine, east along its upper edge and then down to a rectangular-shaped pond—one of six seen in the gorge". When, coming over the crisply dry ridges, we suddenly saw these (Plate 705, fig. 1) and, a little later, a hundred other ponds occupying the broad platter-like top of Tabletop, Coté's gloom suddenly passed; this was a promising moose-country and he would return in the autumn. He had "gone through Hell" unscathed and was reaping his reward. Returning to Lac des Américains we caught 75 more trout. These we cleaned, and when, next morning, we formally moved to a camp-site near the rectangular pond of the day before, these were put into a rubber blanket and carried up the mountain, to piece out the dry foods coming in from the Forks. As it subsequently proved, all the larger lakes and ponds of the Madeleine River system were paved with very hungry trout waiting to be eaten; incidentally *les savons* (partridges, especially the spruce partridges or fool-hens) were very abundant and tame. By throwing a stone or a botanizing-pick we could easily stun them, and in ten minutes they were over the fire. We did not soon hear the end of those stale trout!

Collins's entry for August 4 contains these items: "I tried to make a map of the ponds (large and small) up as far as the first large one above camp. Mapped 45—numbered them in a sketch I made. Got *Polytrichum* eighteen inches long." Later on our ingenuity gave out; we could think of no more names for ponds. There must be many hundreds of them.

"August 7, 1906, Tuesday. Clear in the A. M. Cloudy in the

P. M. Rainy in the evening. Had breakfast of trout, partridge, etc., and about 8.30 Coté, Joe, Fernald and I started down to Triangular Pond (Plate 705, fig. 1) and across to Granite-block Pond, up to Second Peak where I took a panorama. Coté and I then went across the Third Peak while Fernald and Joe worked around Pond no. 101 (southeast of Third Peak). Took panorama from Third Peak. . . On the way from Second to Third Peak I went along edge of barrens above Pond no. 201 and found *Dryas integrifolia* and several other interesting things. [The peaty meadows, bogs and pond-margins in the platter-bottom were semi-temperate, partly arctic-alpine, with a grand mixture of such plants as *Eriophorum tenellum*, temperate American; *E. Chamissonis*, boreal; *Carex rariflora*, arctic-alpine; *C. lenticularis*, var. *albi-montana* Dewey, mostly alpine; *C. limosa*, north-temperate; *C. oligosperma*, temperate North American; *C. saxatilis* var. *miliaris*, boreal American; *Salix argyrocarpa*, alpine; *S. arctophila* Cockerell, the first from south of northern Labrador; *Rubus Chamaemorus*, subarctic; and *Petasites vitifolia* Greene, west-American. The ponds had an equally north-temperate aspect: *Potamogeton epihydrus*, var. *Nuttallii*, temperate North American; *Nuphar variegatum* Engelm., temperate American; carpets of *Subularia aquatica*, circumboreal, and of *Isoëtes macrospora* (boreal American); the newly discovered *Callitriche anceps* (subsequently found in Greenland, Labrador, Newfoundland, and on Mt. Mansfield, Vermont); and *Myriophyllum Farwellii* of the northern states and southeastern Canada. Joe became very keen at detecting specific differences and, although he had never heard of such erudite subjects as grammar, syntax and rhetoric, he promptly got hold of the Latin names. He and I worked much together, each of us taking one side of a pond. I well remember calling across, 'Is there anything new over there, Joe?' and receiving the immediate reply, 'No, there's nothing here but *Subularia aquatica* and *Isoëtes macrospora*.' The region of Tabletop where we camped was of highly feldspathic pink granite, and the dry slopes and crests supported the usual alpine and subalpine plants of granitic mountains, rather notable through the absence of *Arenaria groenlandica*, which we found only once (on one of the easternmost crests). Toward the northwest and north, in the area we

visited, the outer walls were of calcareous rocks, as if the granitic mass, as it rose, had carried with it a northwestern fringe of limy rock from below. It was this edge which Collins reached when he noted *Dryas integrifolia.*] After lunch we all went back to this place and worked the barrens above Pond no. 201 and also to some extent the upper slope of the next ravine north of no. 201. Found a good many interesting plants", including the following calcicolous species: *Juncus castaneus* Sm., the first from south of Labrador; *Tofieldia palustris*, a wide-ranging boreal species; a remarkable willow with large persistent stipules, *Salix calcicola* Fern. & Wieg.; the then undescribed and essentially endemic *Draba Allenii;* a little rosulate *Saxifraga*, resembling the arctic *S. nivalis* L., but with minute cuneate petals, the new *S. gaspensis*, subsequently found in northern Labrador and abundant with *Draba Allenii* on the calcareous schists of the Mt. Logan area; *Epilobium Drummondii* Hausskn. of the Rocky Mountains; *Pyrola grandiflora* Radius, the tiny-leaved and large-flowered arctic ally of *P. rotundifolia; Pedicularis flammea* L., another arctic species at the first station known south of northern Labrador; *Campanula uniflora* L. ditto; a brand new goldenrod, the endemic *Solidago mensalis;* and the beautiful discoid *Senecio* with purple involucres and deep orange disks, the Cordilleran *S. pauciflorus* Pursh. In spring-rills of this area *Cerastium cerastioides* (L.) Britton, an anomalous arctic plant, almost as well placed in *Stellaria*, abounded. Another afternoon, while Collins was working over his mosses, I returned with Joe, further to explore the walls of this "Marble Ridge". A leaf somewhat suggesting a *Taraxacum* but mottled and surely not belonging to *Taraxacum* because the young scape was solid and the young phyllaries ciliate, greatly puzzled me, and better material was secured of some of the other specialties. Unfortunately, Joe was in an insubordinate mood and I soon told him to go back to camp. He had forgotten that we were not out merely for his personal gratification. Very soon, however, I regretted that I was alone, for on the treacherous scree I twisted my ankle and immediately one of my expensive high boots chafed the injury, and I was forced alternately to hobble and crawl four miles back to camp, arriving there quite exhausted and having lost the strange Composite. (In 1923 this proved to be the new *Agoseris gas-*

pensis, a species subsequently found elsewhere only on mountains of northern British Columbia). Evidently Joe did not tell Collins why he went back to camp alone, for the record simply reads: "Joe came back in late P. M. to get some firewood. Fernald went on alone from Pond no. 201 to Marble Ridge. He came in long after dark, having had a hard, slow trip home on account of one of his boots skinning an injured ankle. He gave the boots to Joe when he got back"; the gift intended to heap coals of fire on the head of the rebel, who promptly put on the boots and wore them the rest of the trip!

At the northeastern border of the platter-bottom of Tabletop some of the high domes are of a whitish syenite, consequently slightly calcareous. We got to this region, draining into the Madeleine River, only for a short side-trip in August, 1906, just enough to show how different it is from the granite area where we had chiefly camped.

"August 9, 1906, Thursday. Very cold last night. Fernald and Joe got up about 4:30 A. M. After breakfast Joe, Coté, Fernald and I started for the eastern edge of the mountain at 8:45 . . . went up the 'South Dome' [Botanists' Dome of Coleman's report] and built a cairn for marking spot—altitude 4100 feet. Fernald, Coté and Joe started southeast to a lake we called 'Lac Coté' to make camp, while I went up on the big main dome alone and built a cairn [Mt. Jacques Cartier of recent Canadian maps]. Big dome 4250 feet. . . On the way down found Fernald collecting *Phegopteris alpestris*, new to eastern America"—not only new to eastern America, but new to science, for it is the endemic *Athyrium alpestre*, var. *gaspense*.[1]

"August 14, 1906 . . . Left our camp in the ravine of the East Fork of the Ste. Anne River at 7:45 A. M. in a dense fog. Came down over the regular Low's Trail. . . . Reached our old camp at the Forks at 6:15 P. M. Pedometer 12 miles. Altitude 675 feet, which means that 30 to 50 feet should be added to all altitudes taken on Tabletop Mountain."

[1] In the 1923 trip to the northeastern region of Tabletop after Collins had returned home, the smaller half of our large Mt. Logan party, Carroll W. Dodge, Lyman B. Smith and I, found in this syenitic area a great many additional species: *Carex capitata;* the famously localized *C. macloviana* D'Urv. (of the Falkland Islands and Patagonia and scattered spots in arctic and subarctic regions); the arctic *Saxifraga cernua* L. and *Gnaphalium supinum;* the almost endemic *Agoseris gaspensis*, finally in flower and young fruit, and many other rare things.

"August 16, 1906. Very cold in the tent towards morning. Clear now. Temperature 40 degrees."

In 1907 Mrs. Fernald and I took a delayed honeymoon to Bic and to Percé, with Collins as the third member of the party. These regions having been already covered by the preceding narrative, only a few items need mention. At Bic we regularly left the hotel after breakfast and arranged for a hearty evening meal, taking with us for lunch only bread, butter, tea and some sweets. When M. Pineau expressed surprise that we needed so little we explained to his horror, that we regularly cooked clams, mussels or mushrooms and wild vegetables; that was terrible, clams and mussels were deadly poisonous (as were mushrooms) and used only for fish-bait, and only cattle ate wild plants! With a recruit in the party we explored many new spots, roped precipitous cliffs (Plate 706, fig. 1) to get at herring-gulls' nests, and otherwise shocked the staid people of Bic who had never seen a woman scale vertical walls. Where the herring-gulls had their nests, *Draba minganensis*, *arabisans* and *glabella* and *Primula laurentiana* were stripped of flowers, fruit and new foliage. Elsewhere they were intact; only one inference was obvious.

Then we went on to Percé, again revelling in the work with the alpine rope. We had all been very seasick during a stormy trip on the "Lady Eileen", from Dalhousie to Percé, arriving at about 3 A. M. I shall never forget the breakfast at 3:30 A. M. at M. Le Boutillier's, such a contrast to our meals the first summer at Percé—heaping platters of lobster and of "Gaspé oysters" (cod-tongues and sounds), our introduction to the latter delectable dish. The cliffs of Grande Coupe (Plate 707, fig. 2) were reclimbed (with difficulty on account of "overhang") and those of Mt. Ste. Anne again raked for specialties; but the great new trip was to Bonaventure Island, a long red calcareous-conglomerate island, famous as one of the great breeding haunts of gannets, puffins and other sea-birds. The people at Percé, on the mainland, are derived from French-speaking ancestors, originally from Jersey. Their distant cousins on Bonaventure Island often can not talk to them for, although also from Jersey, they came much later and speak only English. "Willie" Duval, long familiar to tourists (who, in 1907, were unknown) took us over in his sailboat and we spent two wonderful days on

the Island. On the overhanging shelf of rock (PLATE 707, FIG. 1) where we landed there was a strange grass, the new and endemic *Puccinellia macra* Fern. & Weath.; and all the way from the landing to the Duval house we walked on Drabas, Euphrasias and other choice plants which form much of the turf. There was, naturally, a great temptation to spend our time on the rope, down among the tens of thousands of nesting gannets, razor-billed auks, sea-pigeons and other inhabitants of the cliffs. The old gannets, with wing-stretch of 6 feet or more would leave the young on the shelves of rock and, flying in great circles about us, shout "go-rock! go-rock! go-rock!" No plants grew down among the crowded nests, however, and we, consequently, returned to the turfy crests (PLATE 700, FIG. 2) collecting most of the Percé specialties and getting particularly fine material of *Draba pycnosperma* (often eaten off); *Epilobium glandulosum* Hausskn. of the North Pacific region; *Oxytropis johannensis*, described from the upper St. John in Maine; the tiny *Sagina procumbens*, var. *compacta* Lange, the arctic extreme of the species, not previously recorded from south of Greenland; *Euphrasia purpurea* Reeks, described from Newfoundland; and *Descurainia Richardsonii* (Sweet) O. E. Schulz, of the Rocky Mountains.

That trip closed for many years my long expeditions with Collins. His duties in government work kept him from joining the parties which spent succeeding summers in Nova Scotia and Newfoundland, so that our work together consisted then of occasional week-end exploration of pond-shores and swamps of Rhode Island. On these brief trips in his adopted state we were able to add to the known flora of the state some nice things (*Rhynchospora Torreyana*, *Eupatorium leucolepis*, var. *novae-angliae*, etc.), but these are insignificant in comparison with his own discoveries in the state. In 1923, however, Collins got off long enough to spend much of July in the party which went to the Mt. Logan region of Gaspé. The preceding summer Pease and I had tapped the region, one of calcareous schists, whereas Mt. Albert to the east is serpentine and amphibolite and, still farther east, the small part of Tabletop we knew is granite or syenite, with marble and other calcareous rock at the northwestern edge; and from our very brief visit Pease and I knew

that another alpine flora was on Logan. Whereas our first trip into the Shickshock Mountains had been by Gaspé canoes up-river, we now left Cap Chat in automobiles[1] and drove to the farm farthest up Rivière Cap Chat, Émond's. There the party, Pease, the late Kenneth K. Mackenzie, Ludlow Griscom, Carroll W. Dodge, Lyman B. Smith, Collins and I, with the guides, transferred the collecting- and camp-equipment and the foodstuffs to lumber-wagons and proceeded by lumber-road to up-river headquarters in a log-cabin about west of the Mt. Logan range. Thence we packed across to the high basin which lies under a steep escarpment below the summit-levels of the Mt. Logan system and after much preliminary botanizing moved our camp to a higher level and continued work there. The physiographic details of this mountain-area have already been discussed and illustrated elsewhere.[2] I need not go into them here. This trip and the one preceding it yielded, as we had thought, a great many important additions to the Shickshock flora. Of course the more or less ubiquitous alpines are there but there are many specialties. The cool slopes are most frequently carpeted with the beautiful *Salix vestita* (Plate 699, fig. 2), with an abundance of *Draba Allenii*, otherwise known only on Tabletop, or of the new and endemic *D. clivicola*, with *Barbarea orthoceras* Ledeb. of Siberia and northwestern America abundant. *Saxifraga cernua*, *S. rivularis* and the local *S. gaspensis* are frequent. In some of the chimneys *Arnica louiseana* Farr, of Lake Louise in the Canadian Rockies, abounds; in others there are endless variations of *Senecio resedifolius* Lessing, of the Bering Sea region and the Altai of Siberia. On some of the alpine meadows *Epilobium boreale* Hausskn. of Alaska, *Galium Brandegeei* Gray, of the

[1] Many incidents, some merely amusing, some almost tragic (like the overturning of one of the automobiles or the dropping of a horse through a weak corduroy) occurred. These can hardly be enumerated here. One, however, was so amusing that it must be told. Mackenzie, always dogmatic, promply resented the British government's allowing the French Canadians to speak anything but English. He refused to recognize any other language and would not concede the "*si'l vous plait*" and "*merci*" necessary for a smooth passage through the country. Griscom, early educated in France, spoke better than the natives and at Lefrancois', when dinner was nearly finished, he would quietly explain to the waitress that M. Mackenzie was terribly hungry (in fact a gourmand); and when large new helpings were set, to his amazement, at Mackenzie's place, the joker would calmly reach over and draw them to his own place.

[2] Collins and Fernald, *The Region of Mt. Logan, Gaspé Peninsula.* Geogr. Rev. xv. 84–91, with map and illustr. (1925).

Fig. 1 (upper): Cliff-climbing at Bic (Margaret H. and Merritt L. Fernald descending to Herring-Gulls' Nests).
Fig. 2 (lower): Castellated Cliff west of Bic.

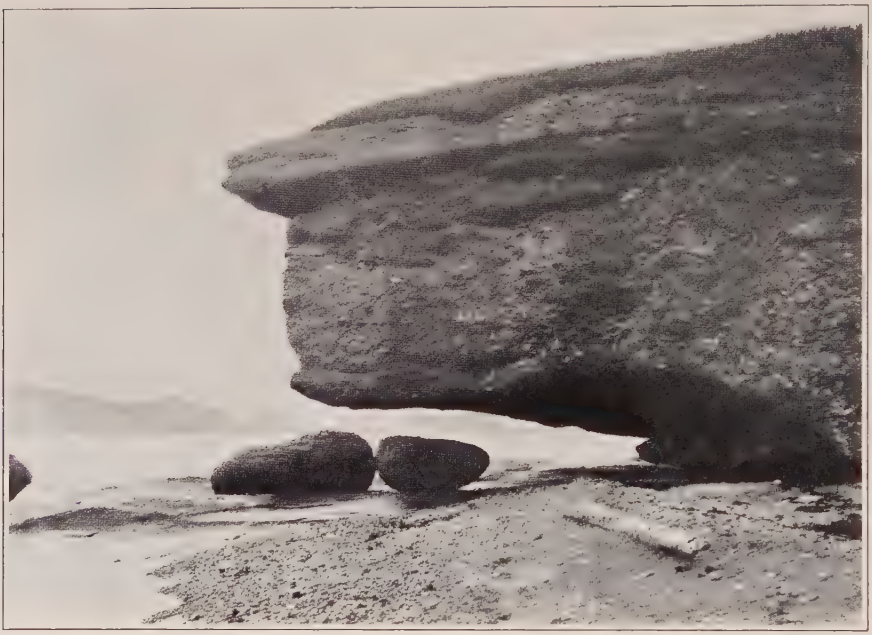

Fig. 1 (upper): Our Landing-Place, Bonaventure Island, Type-station of Puccinellia macra.
Fig. 2 (lower): Overhanging Wall of Grande Coupe, Percé.

Rocky Mountains, and *Luzula sudetica* (Willd.) DC., of arctic-alpine Europe occur. The pass between Mts. Fortin and Mattaouisse is distinguished by the arctic *Potentilla emarginata* Pursh and *Draba nivalis* Liljebl., at their first known stations south of northern Labrador, and the arctic *Carex norvegica* Retz. (*C. alpina* Swartz), also at its first station so far south. One ridge gave us the high-arctic *C. nardina* Fries, while the slope beneath bore the Rocky Mountain *Arenaria macrophylla;* bare crests had the Mt. Washington *Euphrasia Oakesii*, and on the tablelands two new species of *Antennaria* are noteworthy, the strictly endemic *A. Peasei*, and another, *A. vexillifera*, shared with the lime-barrens of western Newfoundland.

The Mt. Logan trip was as worth-while as Collins's and my introductory trip to Gaspé twenty years earlier. It was a fitting climax to our work together in that fascinating country. Our first season, at Bic, Carleton, on the Little Cascapedia and at Percé, yielded scores of species never before known south of the St. Lawrence or east of the Rocky Mountains or even the Pacific slope, with a good share new to science; the last trip was almost as productive. Although the Gaspé flora had been earlier explored by John Macoun, John A. Allen and some others, they left plenty to be discovered.[1] There is much more to be found; but with the self-sacrificing, financially unsupported and unremunerated but always skillful and cheerful coöperation of Collins a real start was made; without it little would have been accomplished. In 1903 Gaspé meant nothing to botanists[2]; by 1907 it had become famous as one of the botanically unique regions.

Throughout his active period of collecting Collins was primarily interested in Bryophytes. His collections and memoranda

[1] One Canadian botanist, prominent on account of his official position but given to "plain thinking and high drinking," repeatedly wondered at our finding so much about Percé. He went there every summer and "never could find anything of interest." One doesn't if he sits about the front porch or in the bar.

[2] Collins and I, with no grants in aid of our work, tried, without much success, to get back a small part of the expenses of our trips by selling uniform sets of the Gaspé material. A letter from St. Petersburg (now Leningrad) stated that their herbarium was already rich in Alaskan plants and that they needed no more! "Gaspé Peninsula, Quebec," meant nothing to their geographic sense. Specific and varietal names like *aleuticum, sitchense, alaskana, unalaschcensis, Menziesii, oregana, Douglasii, dawsonensis, Bongardiana, beeringiana. Romanzoffiana, Fischeriana, Chamissonis, mandjuricum, sajanensis, davuricum, sibiricum, kamtschaticum, Langsdorfii, Kotzebuei, Gmelini* and *tatarica* sufficiently indicated the region.

on the mosses are invaluable. Of these, his chief interest for years, I am unable to write; but I constantly recognized the care with which he collected and the endless pains he took to have his data accurate. His own collections, presented to the Gray Herbarium, the Farlow Herbarium and the New England Botanical Club, will always be a reminder of his thoroughness. When, gradually dropping his activities through an increasing paralysis, he asked C. A. Weatherby and me to come to his apartments, to move his herbarium and library while he could yet oversee the transfer, he said with his accustomed cheerfulness: "I've had more than forty years of satisfactory exploration and botanizing. What more could one ask?", not mentioning the fact, that for four decades he had looked forward to his years of retirement, when he would concentrate upon his mosses. The paralysis of his hands, while his brain and eyes were still acute, prevented the delicate manipulation necessary for that work. And as we packed the books and papers, preliminary to his moving to a sanitarium, he retained his diaries because, with them before him, he could live over again his long period of active field-work.

The many photographs taken by Collins naturally include few of himself and those are in groups, taken when he had joined the party after setting his camera.[1] He did, however, delight in photographing plants in their natural habitats. It seems fitting, therefore, to add to this account of our field-work together a few of his photographs, some of scenes or incidents in our work together, some of plants rarely pictured. These I offer as a slight recognition of the genius of a sincere and wholly unselfish friend.

Appendix I.

Those who follow us may be glad to have a brief summary of the regions in eastern Quebec and the seasons of collecting by Collins and me. They are as follows, with the addition of other trips to eastern Quebec by myself or those exploring with me or influenced by Collins or me to visit the region.

[1] A characteristic picture of Collins on the alpine rope is in Fernald, *Botanizing on the Gaspé Sea-cliffs*, Harvard Alumni Bull. xxxiv. 419–425—repr. 1–7 (1932).

1902

E. F. Williams and M. L. Fernald, late July and early August: Matapedia, Bonaventure County; mouth of Bonaventure River and region of New Carlisle and Paspebiac to Port Daniel, Bonaventure County; Rivière du Loup, Temiscouata County; St. Alphonse, Saguenay River, Chicoutimi County.

1904

G. H. Richards and M. L. Fernald, late June: valley of Grande Rivière, Gaspé County.

M. L. Fernald, late June: Escuminac, Bonaventure County.

J. F. Collins and M. L. Fernald, July 11–13: Rivière du Loup and Cacouna, Temiscouata County. July 14: St. Alphonse, Saguenay River, Chicoutimi County, and Tadousac, Saguenay County. July 15–18: Bic and vicinity, Rimouski County. July 19: Matapedia, Bonaventure County. July 19 and 20: lower Nouvelle River and region of St. Jean l'Evangéliste, Bonaventure County. July 21 and 22: Carleton and Tracadigash Point, Bonaventure County.

J. F. Collins, M. L. Fernald and A. S. Pease, July 23–27: Carleton and vicinity, and Tracadigash Mountain, Bonaventure County. July 28 and 31 and August 1: New Richmond, Bonaventure County. July 29 and 30: Little Cascapedia River to slightly above the Forks. August 2 and 3: about mouth and lower islands of Bonaventure River. August 5, 6 and 8: Bonaventure River as far up as Mt. Baldé. August 11–15: region about Grande Rivière, Gaspé County. August 16: Grande Rivière to Percé. August 16–19: region of Percé, Gaspé County. August 20: Percé to Douglastown, Gaspé County, collecting slightly on southwest slopes of Percé Mountain and at Barachois. August 21 and 22: region of Douglastown and Seal Cove River. August 23: lower Douglastown River. August 24: Douglastown to Gaspé Basin. August 24–27: region of Gaspé, York, and lower Dartmouth River.

Fayette F. Forbes, July, August: Rivière du Loup to Ste. Anne des Monts.

1905

E. F. Williams, J. F. Collins, M. L. Fernald and others, July 5 and 6: Rivière du Loup and Cacouna, Temiscouata County. July 6–10: region of Bic, Rimouski County. July 12–15 (with Oakes and Blanche Ames) and July 17: valley of Grand Cascapedia River, Bonaventure County. July 16: region of New Richmond, Bonaventure County. July 18–21: region of Carleton and Tracadigash Point, Bonaventure County. July 23–26: region of Percé, Gaspé County, July 27: Percé to Gaspé Basin. July 28: region of Gaspé Basin. July 29: lower York River, Gaspé County.

J. F. Collins and M. L. Fernald, July 31: Mont Louis, Gaspé County. August 3–7: valley of Rivière Ste. Anne des Monts, up to the Forks, Gaspé County. August 8–15: Mt. Albert, Gaspé County. August 19–21: mouth of Rivière Ste. Anne des Monts to Ruisseau Castor, Gaspé County. August 24: Father Point, Rimouski County. August 24: Rivière du Loup.

1906

J. F. Collins and M. L. Fernald, July 3–8: region of Bic. July 10: Little Métis, Matane County. July 11 and 12: Little Métis to Ste.

Anne des Monts. July 13–17 and 30 and August 15–17: Rivière Ste. Anne des Monts, up to the Forks. July 18–28: Mt. Albert. July 31: Forks of Rivière Ste. Anne des Monts to Lac des Américains. August 1: Lac des Américains. August 2–13: northern end of Tabletop Mountain (Montagne de la Table), Gaspé County. August 14: Tabletop to Forks of Ste. Anne des Monts (Low's Trail).

1907

J. F. Collins, M. L. Fernald and Margaret H. Fernald, July and August: regions of Bic and of Percé.

1910

K. M. Wiegand and M. L. Fernald, late July and early August: Blanc Sablon, Straits of Belle Isle, eastern Saguenay County.

1912

M. L. Fernald, E. B. Bartram, Bayard Long and Harold St. John, July: Magdalen Islands.

M. L. Fernald, Bayard Long and Harold St. John, August: Magdalen Islands.

1914

Harold St. John, August: Brion Island and Bird Rock, Magdalen Islands.

1915

Harold St. John, June–September: Côte Nord eastward to Straits of Belle Isle.

1922

M. L. Fernald and A. S. Pease, July and early August: Lévis to Marsouin River, Gaspé County; Rivière Cap Chat and western section of Mt. Logan region, Matane County; Mt. Nicolasbert, Matane County.

1923

J. F. Collins, M. L. Fernald, A. S. Pease, K. K. Mackenzie, Ludlow Griscom, C. W. Dodge and L. B. Smith, July: Rivière Cap Chat and Mt. Logan region, Matane County; Rivière Ste. Anne des Monts and Mt. Albert, Gaspé County.

M. L. Fernald, C. W. Dodge and L. B. Smith, August: Rivière à Pierre to Lac Pleureuse, and northwestern region of Tabletop Mt., Gaspé County.

N. C. Fassett and H. K. Svenson, August: lower St. Lawrence and Baie des Chaleurs.

1925

K. M. Wiegand, M. L. Fernald, Bayard Long, F. A. Gilbert and Neil Hotchkiss, early September: Blanc Sablon and Blanc Sablon River to Bradore, and Mutton Bay, Saguenay County.

1927

S. L. Kelsey and P. H. Jordan, late July: north coast of Gaspé County.

1928

A. S. Pease, mid-July: Cap Rosier and vicinity, Gaspé County.
Arthur F. Allen, July and August: valley of Rivière Cap Chat and Mt. Logan region, Matane County.

1931

M. L. Fernald, C. A. Weatherby (and others), late June and early July: Levis to Cap Rosier, Gaspé County, thence to Matapedia, Bonaventure County, collecting at numerous stations, especially east of Marsouin River.
M. L. Fernald, C. A. Weatherby and G. Ledyard Stebbins, Jr., July 5: Mt. St. Pierre, Gaspé County.
M. L. Fernald (with daughter and son), September: River St. Lawrence from above Quebec to Ste. Anne de Beaupré and to Bellechasse County (especially Anse St. Vallier).
G. Ledyard Stebbins, Jr., July: Lower St. Lawrence and coast of Gaspé Peninsula.

1934

Walter H. Hodge and John H. Pierce, June and July: Shickshock Mountains of western Matane County (Mt. Blanc, Mt. Bayfield, etc.); Matane River.

Appendix II. Bibliography

The following papers resulted wholly or in large part from the work of Collins and me or of those influenced by us to explore in eastern Quebec. The majority of them would not have been written without Collins's constant aid in securing the material.

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Appendix III. Types and Paratypes

Nearly 200 types or paratypes of new species, varieties or forms (mostly in the Gray Herbarium) were collected on the trips in Quebec by Collins and me or by those working with us or visiting the region through our direct influence, two-thirds of them collected by Collins or with his personal assistance. When his extensive collections of Gaspé mosses are properly studied the number will be greatly extended. In this enumeration the discoveries made in the same region by the energetic workers of the University of Montreal and their collaborators (Brother Marie-Victorin and others), the Institut Agricole d'Oka (Father Louis-Marie and others), and the Canadian government (Dr. Harrison F. Lewis and others) are omitted, as not directly inspired through Collins or those collaborating with him. Their inclusion would greatly extend the list of types, altogether a very remarkable series to come in the 20th century out of one restricted area of temperate and early-settled eastern North America.

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Cystopteris fragilis, var. laurentiana Weatherby in Rhodora, xxviii. 129 (1926). Type from Bic, Rimouski County.

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Athyrium alpestre, var. gaspense Fernald in Rhodora, xxx. 48, pl. 168. Type from Mt. Dunraven, Tabletop Mountain, Gaspé County.

Athyrium angustum, var. laurentianum Butters in Rhodora, xix. 194 (1917). Type from Tabletop Mountain, Gaspé County.

Athyrium angustum, forma confertum Butters in Rhodora, xix. 195 (1917). Type from Tabletop Mountain, Gaspé County.

Botrychium virginianum, var. laurentianum Butters in Rhodora, xix. 209 (1917). Type from Bic, Rimouski County.

Lycopodium annotinum, var. acrifolium Fernald in Rhodora, xvii. 124 (1915). Paratype from Magdalen Islands.

Equisetum palustre, var. nigridens St. John, Victoria Memorial Mus. Mem. cxxiv. 42 (1922). Type from Romaine, Saguenay County.

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Scheuchzeria palustris, var. americana Fernald in Rhodora, xxiii. 178 (1923). Paratype from Tabletop Mountain, Gaspé County.

Sagittaria cuneata, forma hemicycla Fernald in Rhodora, xxxviii. 74 (1936). Type from St. Augustin, Portneuf County.

Bromus Dudleyi Fernald in Rhodora, xxxii. 63, pl. 196, figs. 1–3 (1930). Paratypes from Gaspé and Bonaventure Counties, etc.

Puccinellia coarctata Fernald & Weatherby in Rhodora, xviii. 13, pl. 115, figs. 28–32 (1916). Paratypes from Brest and Romaine, Saguenay County.

Puccinellia laurentiana Fernald & Weatherby in Rhodora, xviii. 14, pl. 115, figs. 33–38 (1916). Type from Carleton, Bonaventure County.

Puccinellia macra Fernald & Weatherby in Rhodora, xviii. 15, pl. 115, figs. 39–43 (1916). Type from Bonaventure Island, Gaspé County.

Puccinellia lucida Fernald & Weatherby in Rhodora, xviii. 16, pl. 116, figs. 54–58 (1916). Type from Cacouna, Temiscouata County.

Poa Fernaldiana Nannfeld in Symb. Bot. Upsal. v. 50, figs. (1935). Paratype from Tabletop Mountain, Gaspé County.

Poa gaspensis Fernald in Rhodora, xxxi. 46 (1929). Type from River Ste. Anne des Monts, Gaspé County.

Poa saltuensis Fernald & Wiegand in Rhodora, xx. 122 (1918). Type from River Ste. Anne des Monts, Gaspé County.

Poa saltuensis, var. microlepis Fernald & Wiegand in Rhodora, xx. 124 (1918). Paratypes from Gaspé and Bonaventure Counties.

Catabrosa aquatica, var. laurentiana Fernald in Rhodora, xxxv. 137, pl. 242, figs. 3 and 4 (1933). Type from Capuchins, Matane County.

Avena striata, forma albicans Fernald in Rhodora, vii. 244 (1905); basis of *Melica striata*, forma *albicans* Fernald in Rhodora, x. 47 (1908), and of Schizachne purpurascens (Torr.) Swallen, forma **albicans** (Fernald), comb. nov. Type from Mt. Albert, Gaspé County.

Agropyron caninum, var. tenerum, forma Fernaldii Pease & Moore in Rhodora, xii. 73 (1910); basis of A. trachycaulum, var. Fernaldii (Pease & Moore) Malte in Ann. Rep., 1930, Nat. Mus. Can. 46 (1932). Paratype from Percé, Gaspé County.

Agrostis geminata, forma exaristata Fernald in Rhodora, xxxv. 211 (1933). Type from North Fork of Madeleine River, Gaspé County.

Calamagrostis lapponica, var. brevipilis Stebbins in Rhodora, xxxii. 56 (1930). Type from Blanc Sablon, Saguenay County.

Trisetum spicatum, var. pilosiglume Fernald in Rhodora, xviii. 195 (1916). Paratypes from Saguenay, Gaspé and Rimouski Counties.

Zizania aquatica, var. brevis Fassett in Rhodora, xxvi. 157 (1924). Type from Levis, Levis County.

Eleocharis uniglumis, var. halophila Fernald & Brackett in Rhodora, xxxi. 72, pl. 183 (1929); basis of E. halophila Fernald & Brackett in Rhodora, xxxvii. 395, pl. 387, figs. 12–14 (1935). Type from mouth of Bonaventure River, Bonaventure County.

Eriophorum spissum Fernald in Rhodora, xxvii. 209 (1925). Paratypes from Saguenay and Gaspé Counties.

Eriophorum tenellum, var. monticola Fernald in Rhodora, x. 47 (1908). Type from Tabletop Mt., Gaspé County.

Carex glareosa, var. amphigena Fernald in Rhodora, viii. 47 (1906); basis of C. bipartita, var. amphigena (Fernald) Polunin, Bot. Can. E. Arctic. pt. i. 115 (1940). Type from Escuminac, Bonaventure County.

Carex Deweyana, var. collectanea Fernald in Rhodora, xv. 93 (1913). Type from Grand Cascapedia River, Bonaventure County.

Carex Garberi, var. bifaria Fernald in Rhodora, xxxvii. 255, pl. 360, figs. 11 and 12 (1935). Type from River Ste. Anne des Monts, Gaspé County.

Carex clivicola Fernald & Weatherby in Rhodora, xxxiii. 233 (1931). Type from Mt. St. Pierre, Gaspé County.

Carex laxiflora, var. leptonervia Fernald in Rhodora, viii. 184 (1906); basis of C. leptonervia Fernald in Rhodora, xvi. 214 (1914). Paratype from Mt. Albert, Gaspé County.

Carex ormostachya Wiegand in Rhodora, xxiv. 196 (1922). Paratype from Bic, Rimouski County.

Carex flava, var. gaspensis Fernald in Rhodora, viii. 200 (1906). Type from Bonaventure River, Bonaventure County.

Carex vesicaria, var. laurentiana Fernald in Rhodora, xxxv. 232 (1933). Paratypes from Saguenay County and Magdalen Islands.

Carex rostrata × saxatilis, var. miliaris, n. hybr., Fernald in Rhodora, x. 48 (1908). Type from Tabletop Mt., Gaspé County.

Juncus bufonius, var. halophilus Buchenau & Fernald in Rhodora, vi. 39 (1904). Type from Rivière du Loup, Temiscouata County.

Juncus balticus, var. stenocarpus Buchenau & Fernald in Buchenau in Engler, Pflanzenr. iv[36]. 141 (1906). Type from mouth of Bonaventure River, Bonaventure County.

Juncus balticus, var. melanogenus Fernald & Wiegand in Rhodora, xiv. 35 (1912). Type from Bradore, Saguenay County.

Allium Schoenoprasum, var. laurentianum Fernald in Rhodora, xxviii. 167 (1926). Paratype from Matapedia, Bonaventure County.

Streptopus oreopolus Fernald in Rhodora, viii. 70 (1906); basis of S. amplexifolius, var. oreopolus (Fernald) Fassett in Rhodora, xxxvii. 99 (1935). Type from Mt. Albert, Gaspé County.

Habenaria obtusata, var. collectanea Fernald in Rhodora, xxviii. 175 (1926). Paratypes from Blanc Sablon, Goynish and Mingan, Saguenay County.

Salix vestita, var. psilophylla Fernald & St. John in St. John, Victoria Memorial Mus. Mem. cxxiv. 44 (1922). Type from Eskimo Island, Mingan, Saguenay County.

Salix anglorum, var. kophophylla Schneider in Bot. Gaz. lxvi. 130 (1918). Paratypes from Mt. Albert, Gaspé County.

Salix anglorum, var. araioclada Schneider in Bot. Gaz. lxvi. 133 (1918). Type from Mt. Albert, Gaspé County.

Salix anglorum, var. antiplasta Schneider in Bot. Gaz. lxvi. 134 (1918). Type from Mt. Albert, Gaspé County.

Salix chlorolepis Fernald in Rhodora, vii. 186 (1905). Type from Mt. Albert, Gaspé County.

Salix chlorolepis, var. antimima Schneider in Bot. Gaz. lxvi. 339 (1918); basis of S. brachycarpa, var. antimima (Schneider) Raup in in Rhodora, xxxiii. 243 (1931). Type from Mt. Albert, Gaspé County.

Salix cordifolia, var. intonsa Fernald in Rhodora, xxviii. 185 (1926). Paratypes from Blanc Sablon, Saguenay County and from Tabletop Mountain, Gaspé County.

Salix cordifolia, var. eucycla Fernald in Rhodora, xxviii. 187 (1926). Paratypes from Archipel Ouapitagone, Saguenay County.

Salix cordifolia, var. tonsa Fernald in Rhodora, xxviii. 187 (1926). Paratype from Mt. Mattaouisse, Matane County.

Salix fuscescens, var. hebecarpa Fernald in Rhodora, ix. 224 (1907); basis of S. hebecarpa Fernald in Rhodora, xxvi. 123 (1924). Type from Mt. Albert, Gaspé County.

Salix rostrata, var. capreifolia Fernald in Rhodora, xvi. 177 (1914); basis of S. Bebbiana, var. capreifolia Fernald in Rhodora, xxvi. 123 (1924). Type from Tourelle, Gaspé County.

Salix rostrata, var. luxurians Fernald in Rhodora, ix. 223 (1907); basis of S. Bebbiana, var. luxurians Fernald in Rhodora, xxvi. 122 (1924). Type from Bic, Rimouski County.

Salix laurentiana Fernald in Rhodora, ix. 221 (1907). Type from Les Méchins, Matane County (formerly Gaspé County).

Salix paraleuca Fernald in Rhodora, xvi. 175 (1914). Type from Grand River, Gaspé County.

Salix stenocarpa Fernald in Rhodora, xvi. 176 (1914). Type from Matapedia, Bonaventure County.

Salix obtusata Fernald in Rhodora, ix. 223 (1907). Type from River Ste. Anne des Monts, Gaspé County.

Salix glaucophylloides Fernald in Rhodora, xvi. 173 (1914). Paratypes from Gaspé and Bonaventure Counties.

Betula alba, var. elobata Fernald in Rhodora, xv. 169 (1913); basis of B. papyrifera, var. elobata (Fernald) Sargent in Journ. Arn. Arb. i. 63 (1919). Type from Mt. Albert, Gaspé County.

Betula pumila, var. renifolia Fernald in Rhodora, xxviii. 190 (1926). Type from Mutton Bay, Saguenay County.

Comandra Richardsiana Fernald in Rhodora, vii. 48 (1905). Type from Grand River, Gaspé County.

Polygonum achoreum Blake in Rhodora, xix. 232 (1917). Paratype from York, Gaspé County.

Polygonum Hydropiper L., var. projectum Stanford in Rhodora, xxix. 86 (1927). Paratypes from Magdalen Islands, etc.

Arenaria cylindrocarpa Fernald in Rhodora, xvi. 43 (1914). Type from Mt. Albert, Gaspé County. Better referred to A. humifusa Wahlenb. Fl. Lapp. 129 (1812).

Arenaria verna, var. propinqua, forma epilis Fernald in Rhodora, viii. 32 (1906); basis of *A. verna*, var. *pubescens*, forma *epilis* Fernald in Rhodora, xxi. 22 (1919) and of A. rubella, forma epilis (Fernald) Polunin in Rhodora, xli. 39 (1939). Type from Percé, Gaspé County.

Arenaria litorea Fernald in Rhodora, viii. 33 (1906). Type from Carleton, Bonaventure County. Apparently identical with A. dawsonensis Britton in Bull. N. Y. Bot. Gard. ii. 169 (1901).

Arenaria marcescens Fernald in Rhodora, xxi. 15 (1919). Type from Mt. Albert, Gaspé County.

Stellaria calycantha, var. laurentiana Fernald in Rhodora, xlii. 254 (1940). Type from Christie, Gaspé County.

Ranunculus subrigidus W. B. Drew in Rhodora, xxxviii. 39, pl. 406, figs. 1, 4 and 10 (1936). Type from York River, Gaspé County.

Ranunculus Purshii, var. prolificus Fernald in Rhodora, xix. 135 (1917); basis of R. Gmelini, var. prolificus (Fernald) Hara in Rhodora, xli. 386 (1939). Type from Magdalen Islands.

Ranunculus pygmaeus, var. petiolulatus Fernald in Rhodora, xix. 137 (1917). Type from Mt. Albert, Gaspé County. According to Dr. M. P. Porsild in Arbejder fra Danske Arkt. Sta. Disko, no. 13: 42–44 (1930), this is the rare plant of Greenland, R. pygmaeus, var. Langeana Nathorst in Öfv. K. Vet. Akad. Förh., 1884, no. 1: 46 (1884).

Ranunculus Allenii Robinson in Rhodora, vii. 220 (1905). Type from Mt. Albert, Gaspé County.

Ranunculus abortivus, var. acrolasius Fernald in Rhodora, xl. 418, pl. 519, figs. 1 and 2 (1938). Paratypes from Saguenay, Gaspé and Matane Counties.

Anemone multifida, forma polysepala Fernald in Rhodora, xix. 141 (1917). Type from Grand River, Gaspé County.

Anemone multifida, var. Richardsiana Fernald in Rhodora, xix. 141 (1917). Type from Grand River, Gaspé County.

Anemone multifida, var. Richardsiana, forma leucantha Fernald in Rhodora, xix. 141 (1917). Type from Grand River, Gaspé County.

Anemone riparia, forma rhodantha Fernald in Rhodora, xix. 139 (1917). Type from Grand River, Gaspé County.

Anemone riparia, forma inconspicua Fernald in Rhodora, xix. 140 (1917). Type from Percé, Gaspé County.

Thalictrum polygamum, var. hebecarpum Fernald in Rhodora, x. 49 (1908). Type from Rivière du Loup, Temiscouata County.

Draba Peasei Fernald in Rhodora, xxxvi. 298, pl. 295, figs. 4–7 (1934). Type from Cape Rosier, Gaspé County.

Draba Allenii Fernald in Rhodora, xxxvi. 289, pl. 292 (1934). Type from Fernald Pass, Mt. Mattaouisse, Matane County.

Draba norvegica, var. pleiophylla Fernald in Rhodora, xxxvi. 324, pl. 302 (1934). Paratypes from Blanc Sablon, Saguenay County.

Draba clivicola Fernald in Rhodora, xxxvi. 326, pl. 303 (1934). Type from Big Chimney, Mt. Mattaouisse, Matane County.

Draba incana, var. conica O. E. Schulz in Engler, Pflanzenr. iv[105]. 285 (1927). Type from Percé, Gaspé County.

Draba arabisans, var. orthocarpa Fernald & Knowlton in Rhodora, vii. 66, pl. 60, figs. 10 and 11 (1905); basis of D. glabella, var. orthocarpa (Fernald & Knowlton) Fernald in Rhodora, xxxvi. 336, pl. 310 (1934). Type from Bic, Rimouski County.

Draba megasperma Fernald & Knowlton in Rhodora, vii. 65, pl. 60, figs. 6–8 (1905); basis of D. glabella, var. megasperma (Fernald & Knowlton) Fernald in Rhodora, xxxvi. pl. 311 and 312 (1934). Type from Paspebiac, Bonaventure County.

Draba pycnosperma Fernald & Knowlton in Rhodora, vii. 67, pl. 60, figs. 13–15 (1905). Type from Percé, Gaspé County.

Arabis pycnocarpa Hopkins in Rhodora, xxxix. 113, pl. 458, figs. 1 and 2 (1937); basis of A. hirsuta, var. pycnocarpa (Hopkins) Rollins in Rhodora, xliii. 318 (1941). Type from Nouvelle, Bonaventure County.

Arabis pycnocarpa, var. reducta Hopkins in Rhodora, xxxix. 117 (1937). Type from Carleton, Bonaventure County.

Arabis divaricarpa, var. stenocarpa Hopkins in Rhodora, xxxix. 133 (1937). Type from Bic, Rimouski County.

Arabis Collinsii Fernald in Rhodora, vii. 32 (1905); basis of A. Holboellii, var. Collinsii (Fernald) Rollins in Rhodora, xliii. 445 (1941). Type from Bic, Rimouski County.

Drosera rotundifolia, var. comosa Fernald in Rhodora, vii. 9 (1925). Type from Grand River, Gaspé County.

Saxifraga cernua, var. latibracteata Fernald & Weatherby in Rhodora, xxxiii. 234 (1931). Type from Tabletop Mountain, Gaspé County.

Saxifraga gaspensis Fernald in Rhodora, xix. 141 (1917). Type from Tabletop Mountain, Gaspé County.

Ribes oxyacanthoides, var. calcicola Fernald in Rhodora, vii. 155 (1905); basis of R. hirtellum, var. calcicola Fernald in Rhodora, xiii. 76 (1911). Type from mouth of Bonaventure River, Bonaventure County.

Amelanchier sanguinea, var. gaspensis Wiegand in Rhodora, xiv. 139 (1912); basis of A. gaspensis (Wieg.) Fernald & Weatherby in Rhodora, xxxiii. 235 (1931). Type from Bonaventure River, Bonaventure County.

Amelanchier Fernaldii Wiegand in Rhodora, xxii. 149 (1920). Type from Magdalen Islands.

Rubus idaeus, var. strigosus, forma tonsus Fernald, in Rhodora, xxi. 96 (1919). Type from Mt. Albert, Gaspé County.

Rubus idaeus, var. eucyclus Fernald & Weatherby in Rhodora xxxiii. 237 (1931). Type from Ruisseau a Rebour, Gaspé County.

Fragaria multicipita Fernald in Rhodora, x. 49 (1908). Type from River Ste. Anne des Monts, Gaspé County.

Geum pulchrum Fernald in Rhodora, viii. 11 (1906). Type from Bic, Rimouski County.

Rosa Williamsii Fernald in Rhodora, xx. 95 (1918). Type from Bic, Rimouski County.

Astragalus scrupulicola Fernald & Weatherby in Rhodora, xxxiii. 238, fig. 1 (1931). Type from Mt. St. Pierre, Gaspé County.

Atelophragma Fernaldi Rydberg in Bull. Torr. Bot. Cl. lv. 126 (1928); basis of Astragalus Fernaldi (Rydb.) H. F. Lewis in Can. Field Nat. xlvi. 36 (1932). Type from Blanc Sablon, Saguenay County.

Astragalus gaspensis Rousseau in Contrib. Lab. Bot. Univ. Montréal, no. 24: 51, figs. 15 and 16 (1933); basis of A. frigidus, var. gaspensis (Rousseau) Fernald in Rhodora, xxxix. 313, pl. 472, figs. 9–13 (1937). Topotype from Little Cascapedia River, Bonaventure County.

Oxytropis gaspensis Fernald & Kelsey in Rhodora, xxx. 123 (1928). Type from Mt. St. Pierre, Gaspé County.

Callitriche anceps Fernald in Rhodora, x. 51 (1908). Type from Lac des Americaines, Tabletop Mountain, Gaspé County.

Empetrum atropurpureum Fernald & Wiegand in Rhodora, xv. 214 (1913). Paratype from Magdalen Islands.

Empetrum Eamesii Fernald & Wiegand in Rhodora, xv. 215 (1913). Paratype from Blanc Sablon, Saguenay County.

Viola cucullata, var. microtitis Brainerd in Rhodora, xv. 112 (1913). Paratype from Magdalen Islands.

Viola adunca, var. glabra Brainerd in Rhodora, xv. 109 (1913). Type from Carleton, Bonaventure County.

Epilobium palustre, var. longirameum Fernald & Wiegand in Rhodora, xiii. 188 (1911). Type from Blanc Sablon, Saguenay County.

Epilobium densum, var. nesophilum Fernald in Rhodora, xx. 29 (1918); basis of E. nesophilum Fernald in Rhodora, xxvii. 32 (1925). Type from Magdalen Islands.

Epilobium glandulosum, var. cardiophyllum Fernald in Rhodora, xx. 35 (1918). Type from Low's Trail, Gaspé County.

Epilobium glandulosum, var. brionense Fernald in Rhodora, xx. 35 (1918). Type from Magdalen Islands.

Epilobium glandulosum, var. ecomosum Fassett in Rhodora, xxvi. 48 (1924); basis of E. ecomosum (Fassett) Fernald in Rhodora, xxxiv. 39 (1932). Type from St. Vallier, Bellechasse County.

Myriophyllum exalbescens Fernald in Rhodora, xxi. 120 (1919). Type from York River, Gaspé County.

Myriophyllum magdalenense Fernald in Rhodora, xxi. 123 (1919) and xxvi. 198 (1924). Type from Magdalen Islands.

Sanicula marilandica, var. borealis Fernald in Rhodora, xxviii. 220 (1926). Paratypes from Gaspé and Bonaventure Counties.

Angelica laurentiana Fernald in Rhodora, xxviii. 222 (1926). Paratype from Boishébert, Saguenay County.

Cornus canadensis, forma rosea Fernald in Rhodora, xliii. 156 (1941). Type from Mt. Mattaouisse, Matane County. Apparently inseparable from *Chamaepericlymenum canadense*, forma *purpurascens* Miyabe & Tatewaki in Trans. Sapporo Nat. Hist. Soc. xv. 43 (1937); basis of Cornus canadensis, forma purpurascens (Miyabe & Tatewaki) Hara in Rhodora, xliv. 20 (1942).

Arctostaphylos Uva-ursi, var. coactilis Fernald & Macbride in Rhodora, xvi. 212 (1914). Paratype from Magdalen Islands.

Vaccinium nubigenum Fernald in Rhodora, x. 53 (1908). Type from Mt. Albert, Gaspé County.

Primula farinosa, var. macropoda Fernald in Rhodora, ix. 16 (1907); basis of P. laurentiana Fernald in Rhodora, xxx. 68, pl. 169 (1928). Type from Bic, Rimouski County.

Androsace septentrionalis, var. robusta St. John, Victoria Memorial Mus. Mem. cxxiv. 48 (1922). Type from Ile Ste. Geneviève, Mingan, Saguenay County.

Statice labradorica, var. submutica Blake in Rhodora, xix. 7 (1917). Type from Mt. Albert, Gaspé County.

Lomatogonium rotatum, forma ovalifolium Fernald in Rhodora, xxi. 197 (1919). Type from Magdalen Islands.

Cynoglossum boreale Fernald in Rhodora, vii. 250 (1905). Type from Little Cascapedia River, Bonaventure County.

Scutellaria lateriflora forma rhodantha Fernald in Rhodora, xxiii. 86 (1921). Type from Dartmouth River, Gaspé County.

Prunella vulgaris, var. lanceolata, forma candida Fernald in Rhodora, xv. 184 (1913). Paratype from River Ste. Anne des Monts, Gaspé County.

Mimulus ringens, var. colpophilus Fernald in Rhodora, xxxiv. 119 (1932). Type from mouth of Chaudière River, Levis County.

Gratiola lutea, var. glaberrima Fernald in Rhodora, xxxiv. 149 (1932). Type from Anse St. Vallier, Bellechasse County.

Euphrasia Oakesii, forma lilacina Fernald & Wiegand in Rhodora, xvii. 185 (1915). Type from Blanc Sablon, Saguenay County.

Euphrasia purpurea, forma candida Fernald & Wiegand in Rhodora, xvii. 187 (1915). Type from Magdalen Island.

Euphrasia purpurea, var. Randii, forma albiflora Fernald & Wiegand in Rhodora, xvii. 188 (1915). Paratype from Magdalen Islands.

Euphrasia disjuncta Fernald & Wiegand in Rhodora, xvii. 190 (1915). Paratypes from eastern Saguenay County.

Rhinanthus oblongifolius Fernald in Rhodora, ix. 24 (1907). Type from Tabletop Mt., Gaspé County.

Plantago juncoides, var. laurentiana Fernald in Rhodora, xxvii. 102, pl. 150, fig. 5 (1925). Paratype from Magdalen Islands.

Plantago oliganthos, var. fallax Fernald in Rhodora, xxvii. 103, pl. 150, fig. 7 (1925). Paratypes from Carleton, Bonaventure County, etc.

Galium brevipes Fernald & Wiegand in Rhodora, xii. 78 (1910). Type from Grand River, Gaspé County.

Galium trifidum, var. halophilum Fernald & Wiegand in Rhodora, xii. 78 (1910). Type from mouth of Bonaventure River, Bonaventure County.

Sambucus pubens, forma calva Fernald in Rhodora, xxxv. 310 (1933). Type from Fernald Pass, between Mts. Mattaouisse, Fortin and Logan, Matane County.

Eupatorium perfoliatum, var. colpophilum Fernald & Griscom in Rhodora, xxxvii. 182 (1935). Type from Berthier, Montmagny County.

Solidago hispida, var. disjuncta Fernald in Rhodora, xvii. 2 (1915). Paratype from Tabletop Mountain, Gaspé County.

Solidago chlorolepis Fernald in Rhodora, xvii. 3 (1915). Type from Mt. Albert, Gaspé County.

Solidago multiradiata, var. parviceps Fernald in Rhodora, xxxviii. 202, pl. 417, fig. 2 (1936). Type from near Cape Rosier, Gaspé County.

Solidago mensalis Fernald in Rhodora, xvii. 4 (1915). Type from Tabletop Mountain, Gaspé County.

Solidago chrysolepis Fernald in Ottawa Nat. xix. 168 (1905). Type from River Ste. Anne des Monts, Gaspé County.

Solidago lepida, var. molina Fernald in Rhodora, xvii. 9 (1915). Type from Percé, Gaspé County.

Solidago lepida, var. fallax Fernald in Rhodora, xvii. 9 (1915). Paratypes from Gaspé and Bonaventure Counties.

Solidago graminifolia, var. septentrionalis Fernald in Rhodora, xvii. 12 (1915). Paratype from St. John (Douglastown) River, Gaspé County.

Aster foliaceus, var. arcuans Fernald in Rhodora, xvii. 14 (1915). Type from St. John (Douglastown) River, Gaspé County.

Aster foliaceus, var. crenifolius Fernald in Rhodora, xvii. 15 (1915). Type from Grand River, Gaspé County.

Aster foliaceus, var. subpetiolatus Fernald in Rhodora, xvii. 15 (1915). Type from Grand River, Gaspé County.

Aster puniceus, var. perlongus Fernald in Rhodora, xvii. 17 (1915). Type from Tabletop Mountain, Gaspé County.

Aster puniceus, var. firmus, forma rufescens Fassett in Rhodora, xxvii. 187 (1925). Type from Cap-Rouge, Quebec County.

Aster laurentianus Fernald in Rhodora, xvi. 59, pl. 109, figs. 1–3 (1914). Paratype from Magdalen Islands.

Aster laurentianus, var. magdalenensis Fernald in Rhodora, xvi. 59, pl. 119, fig. 4 (1914). Type from Magdalen Islands.

Erigeron ramosus, var. septentrionalis Fernald & Wiegand in Rhodora, xv. 61 (1913). Paratype from Douglastown, Gaspé County.

Erigeron acris, var. oligocephalus Fernald & Wiegand in Rhodora, xii. 226 (1910); basis of E. elatus, var. oligocephalus (Fernald & Wiegand) Fernald in Rhodora, xl. 344, pl. 505, figs. 1 and 2 (1938). Type from Blanc Sablon, Saguenay County.

Antennaria vexillifera Fernald in Rhodora, xxvi. 99, pl. 142, fig. 4 (1924). Type from Tableland between Mts. Mattaouisse and Collins, Matane County.

Antennaria Peasei Fernald in Rhodora, xxvi. 101, pl. 142, fig. 11 (1924). Type from Mt. Logan, Matane County.

Antennaria subviscosa Fernald in Rhodora, xvi. 131 (1914). Type from Bic, Rimouski County.

Antennaria spathulata, var. continentis Fernald & St. John in St. John, Victoria Memorial Mus. Mem. cxxiv. 55 (1922). Type from Natishkwan, Saguenay County.

Antennaria appendiculata Fernald in Rhodora, xxiii. 295 (1922). Type from the Grand River, Gaspé County.

Antennaria glabrifolia Fernald in St. John, Victoria Memorial Mus. Mem. cxxiv. 55 (1922). Type from Natishkwan, Saguenay County.

Antennaria neodioica, var. gaspensis Fernald in Ottawa Nat. xix. 156 (1905); basis of A. gaspensis Fernald in Rhodora, xxxv. 341, pl. 268, figs. at right (1933). Type from Percé, Gaspé County.

Antennaria neodioica, var. interjecta Fernald in Rhodora, xxxv. 342 (1933). Type from Bic, Rimouski County.

Bidens cernua, var. oligodonta Fernald & St. John in Rhodora, xvii. 25 (1915). Type from Magdalen Islands.

Bidens hyperborea, var. gaspensis Fernald in Rhodora, xx. 150 (1918). Type from mouth of Dartmouth River, Gaspé County.

Bidens hyperborea, var. Svensoni Fassett in Rhodora, xxvii. 170 (1925). Type from Rimouski, Rimouski County.

Bidens hyperborea, var. laurentiana Fassett in Rhodora, xxvii. 169 (1925). Type from Cap-Rouge, Quebec County.

Bidens heterodoxa, var. orthodoxa Fernald & St. John in Rhodora, xvii. 24 (1915). Type from Magdalen Islands.

Bidens heterodoxa, var. atheistica Fernald in Rhodora, xxxiv. 116 (1932); basis of B. infirma Fernald in Rhodora, xl. 351, pl. 507, figs. 1–3 (1938). Type from Anse St. Vallier, Bellechasse County.

Bidens frondosa, var. stenodonta Fernald & St. John in Rhodora, xvii. 22 (1915). Paratype from Magdalen Islands.

Senecio pseudaureus, forma ecoronatus Fernald in Rhodora, xxx. 225 (1928). Type from North Fork of Madeleine River, Gaspé County.

Senecio aureus × Balsamitae, n. hybr. Greenman in Rhodora, x. 69 (1908). Type from Bonaventure River, Bonaventure County.

Senecio gaspensis Greenm. in Ann. Mo. Bot. Gard. iii. 138 (1916). Type from Percé, Gaspé County.

Senecio Balsamitae, var. firmifolius Greenm. in Rhodora, vii. 244 (1905); basis of S. pauperculus, var. firmifolius Greenm. in Ann. Mo. Bot. Gard. iii. 166 (1916). Type from Percé, Gaspé County.

Arnica chionopappa Fernald in Rhodora, vii. 148 (1905). Type from Grand River, Gaspé County.

Arnica gaspensis Fernald in Rhodora, vii. 149 (1905). Type from Cap Tourelle, Gaspé County.

Arnica Griscomi Fernald in Rhodora, xxvi. 105, pl. 143, fig. 7 (1924). Type from Mt. Mattaouisse, Gaspé County. Seems specifically inseparable from A. louiseana Farr in Ottawa Nat. xx. 109 (1906).

Cnicus muticus, var. monticola Fernald in Ottawa Nat. xix. 166 (1905); basis of Cirsium muticum, var. monticola Fernald in Rhodora, ix. 28 (1907). Type from Mt. Albert, Gaspé County.

Agoseris gaspensis Fernald in Rhodora, xxvi. 125 (1924). Type from Tabletop Mountain, Gaspé County.

Taraxacum Longii Fernald in Rhodora, xxxv. 379, pl. 273, figs. 1–4 (1933). Paratype from Grand River, Gaspé County.

Taraxacum ambigens Fernald in Rhodora, xxxv. 376, pl. 271, figs. 5–8 (1933). Paratypes from Blanc Sablon, Ste. Anne des Monts River and Grand Cascapedia River.

Taraxacum ambigens, var. fultior Fernald in Rhodora, xxxv. 376, pl. 271, fig. 9 (1933). Paratypes from Fernald Basin, Matane County.

HIERACIUM CANADENSE, var. HIRTIRAMEUM Fernald in RHODORA, xvii. 19 (1915). PARATYPES from Bonaventure County.

HIERACIUM SCABRUM, var. TONSUM Fernald & St. John in RHODORA, xvi. 182 (1914). TYPE from Magdalen Islands.

WILLDENOW'S SPECIES PLANTARUM AND MICHAUX'S FLORA BOREALI-AMERICANA: DATES OF PUBLICATION

BERNICE G. SCHUBERT

In 1891 Otto Kuntze published in the Revisio Generum Plantarum[1] a list of dates of publication for the several parts of Willdenow's edition of Linnaeus's Species Plantarum. Kuntze obtained the dates from Kayser's Bücherlexicon (1835) and with them established a date of publication later than that given on the title page for at least one part of each volume. In reference to parts 3 and 4 of Willdenow's volume III, which came into competition with Michaux's Flora Boreali-Americana, Kuntze said that he was not able to discover whether III[3] (1803) appeared before or after Michaux's Flora (although he gave 1804 as the proper date), but that he gave Michaux precedence because the omission of a date in Willdenow occurred maliciously[2]. The dates offered by Kuntz were subsequently adopted in the international Rules of Botanical Nomenclature.[3]

In an attempt to solve one of the many long-standing problems which have arisen because of the conflict of dates between Willdenow's volume III[3] and Michaux's Flora I have found information concerning the dates of both works which seems worthy of notice.

In the Intelligenzblatt der Allgemeine Literatur-Zeitung (published in Halle and Leipzig), for November 4, 1797 (number 137) volume I part 1 is announced by the Berlin publisher Nauk, in the following manner:

> *In der Naukschen Buchhandlung zu Berlin sind folgende Bücher erschienen:*

[1] O. Kuntze, Rev. Gen. i. cxxiv (1891).

[2] " . . . betr. III[3] 1803 konnte ich nicht ermitteln, ob es vor oder nach Michaux' flora erschien und gebe ich Michaux den Vorzug, weil die Unterlassung der Datumangaben bei Willdenow freventlich geschah."

[3] Int. Rules of Botanical Nomencl. Art. 45 (1935).

[entry no.] 4) Linée species plantarum exhib. plantas rite cognitas ad gen. relatas cum differentiis, nomin. trivial. synon. selectis, locis natal. sec. syst. sexuale digestas. Tom. I. edit. quarta post. Reichard. quinta cura Carl. Lud. Willdenow. Vol. I. p. I. 8 maj. auf. engl. Papr. 2 Rthlr. auf ord. Druckpr. 1 Rthlr. 14 gr.

Therefore 1797, as indicated on the title-page, and not 1798 as stated by Kuntze, is the correct date for volume I part 1.

In the Intelligenzblatt of the same journal for February 1, 1800 (number 16) volumes I and II are listed by Nauk:

Noch sind bey mir folgende Bücher verlegt:

[entry no.] 7) Linne, Carolia., species plantarum cura Willdenow. T. I und II. gr. 8 7 Rthlr. 18 gr.

Thus the date 1799 on the title page of volume II is undoubtedly correct.

In the Intelligenzblatt for January 7, 1801 (number 3) volume III is announced as having been published in 1800, as dated on the title page.

Bey *Nauck* in Berlin ist erschienen, und in jeder guten Buchhandlung zu bekommen:

[entry no. 2] Caroli a Linné Species plantarum cura Willdenow. Tom. III. 8 maj. 1800 2 Rthlr. 8 gr.

The entry which follows here, indicates that the notice above is for part 1 of volume III.

In the Intelligenzblatt for November 10, 1802 (number 208) may be found:

In meiner Buchhandlung ist so eben fertig geworden und zu bekommen:

[entry no.] 2) Linné Species plantarum cura Willdenow. Tom. III p. IIda. 8 maj. 1802. I Rthlr. 16 gr.

After 1802 Nauk seems to have submitted no further lists of his newly published books. That he continued to publish is certain however, because in numerous later reviews he is cited as publisher[4].

Although 1803 is the critical year and no notice of volume III part 3 of Willdenow's work could be found in the Allgemeine

[4] For review of volumes I, II and III see Allgem. Lit.-Zeit. no. 304, 353–359 (Nov. 21, 1805). For review of volume IV see Ergänzungsblatt zur Allgem. Lit.-Zeit. no. 9, 65–71 (Jan. 20, 1807). For review of volume V see op. cit., no. 37, 289–294 (April 3, 1810) and no. 38, 297–301 (April 5, 1810).

Literatur-Zeitung, the following entry from the publishing house of Levrault appeared in the Intelligenzblatt for Saturday, March 19, 1803 (number 59):

> Bey den Gebrüdern *Levrault*, Buchhändlern in Paris und Strasburg sind folgende Bücher in Menge zu haben:
>
> [entry on p. 491, third column of entire list]
>
> Flora Boreali-Americana, sistens 2000 plantas, etc., c'est-à-dire, *Flore de l'Amérique septentrionale*, contenant plus de 2000 plantes, dont la plupart n'avaient jamais été décrites; par *Michaux*, auteur de la description des chênes, naturaliste voyageur dans l'expédition du citoyen Bodin, avec plus de 50 figures de plantes dessinées par Redouté et gravées par Plée; 2 vol. in 8.
>
> *Idem*, 2 vol. in 4. papier-vélin.

Michaux's Flora must, therefore, have been published before March 19, 1803.

In the Botanische Zeitung, a journal founded in 1802 by the Botanical Society of Regensburg, there appeared in volume II, in the number for Monday, March 14, 1803, a notice from Berlin which is quoted here:

> Berlin. Die Willdenowsche Ausgabe der Linnéischen Specierum plantarum wird nun schnell auf einander folgen, indem bereits der 3te Theil des 3ten Bandes unter der Presse ist, der mit Syngenesia anfängt, und sehr interessant werden dürfte.

Since on March 14, 1803, volume III part 3 was still in press, it could hardly have been published before March 19 of the same year, when Michaux's Flora was announced as having been already published, and for sale.

Kuntze's decision, to give Michaux precedence over Willdenow (volume III part 3 but not part 2) was therefore correct, although hardly for the reason which he gave. The dates for volume I and volume III, parts 1 and 2, might well be taken from the publisher's announcement rather than from the trade catalogue of at least 30 years later.

A tabulation of the pertinent dates of Willdenow's work follows:

Volume no.	Date given on title-page of volume.	Date given by Kuntze in Rev. Gen. i. cxxiv. (1890).	Date supplied in publisher's announcement.	Date of publisher's announcement.
I[1]	1797	1798	1797	Nov. 4, 1797
I[2]	——	1798		
II[1]	1799	1799	1799 (by inference)	Feb. 1, 1800
II[2]	——	1800		
III[1]	1800	1801 (to page 850)	1800	Jan. 7, 1801
III[2]	——	1803 (to page 1470)	1802	Nov. 10, 1802
III[3]	——	1804 (to page 2409)	1803 (by inference)	Mar. 14, 1803 (as in press).

Gray Herbarium.

Two Albino Forms of Echinacea from Missouri—In his revision of *Echinacea* Sharp[1] did not list or recognize any white-rayed forms of species within that genus. For the last ten years the writer has known of a white-rayed variant of *Echinacea pallida* Nutt., infrequently encountered on the limestone glades of eastern and southern Missouri. In 1941 Mr. William E. Liggett of University City, Missouri, called the writer's attention to another white-rayed form occurring in *Echinacea purpurea* (L.) Moench. Both forms are known to breed true.

Since apparently neither of these white-rayed variants has received recognition, they may be designated as color forms differing from the respective species in no essential morphological details other than color variation. It is a pleasure to associate the name of the discoverer with the following form.

Echinacea purpurea (L.) Moench, forma **Liggettii** Steyermark, forma nova—A forma typica differt ligulis albis. Missouri: highway 54, west of Niangua River, Dallas Co., transplanted to yard of Mr. William Liggett in University City, Saint Louis Co., July 9, 1940, *William E. Liggett 1* (type, in Herb. Field Mus.).

The other variant may be called

Echinacea pallida Nutt., forma **albida** Steyermark, forma nova—A forma typica differt ligulis albis et floribus disci luteis. Missouri: limestone glade on top of bluffs along Plattin Creek, T 38 N, R 6 E, sect. 7, Koester Springs at Koester, Saint Francois Co., June 4, 1941, *Steyermark 28797* (type, in Herb. Field Mus.).

[1] Sharp, Ward M. Ann. Missouri Bot. Gard. **22**: 84–95. 1935.

In this form the disk is yellow instead of orange- or ruddy-brown, the rays are white, the leaves are paler green, and the stem is pale yellow-green instead of darker green or brownish-purple.—J. A. Steyermark, Field Museum.

Formal Transfers in Cyperus.—

Cyperus esculentus L., forma **angustispicatus** (Britton), stat. nov. Var. *angustispicatus* Britton in Bull. Torr. Bot. Cl. xiii. 211 (1886). Var. *leptostachyus* Boeckl. in Linnaea, ser. 2, xxxvi. 290 (1870) as to description, not as to much of the synonymy.

C. esculentus, forma **macrostachyus** (Boeckl.), stat. nov. Var. *macrostachyus* Boeckl. op. cit. 291 (1870). *C. Hermannii* Buckl. in Proc. Acad. Sci. Phil. (1862) 10. *C. esculentus*, var. *Hermannii* (Buckl.) Britton, op. cit. 214 (1886).

The two extremes of *Cyperus esculentus* with spikelets 2–3 cm. long are striking departures from typical *C. esculentus*, with spikelets 0.5–1.5 cm. long, but they are forms rather than geographic varieties. In forma *angustispicatus* the very narrow spikelets (1.5–2 mm. broad) taper to slender points; in forma *macrostachyus* they are exactly linear, 2–3 mm. broad and rounded at tip. Although Boeckeler's var. *leptostachyus*, as described, seems to have been the plant I am calling forma *angustispicatus*, he cited no type (as he did for his var. *macrostachyus*) and included under it essentially all North and South American material, with a bibliography including many American references to ordinary *C. esculentus* with short spikelets. Kükenthal, likewise, taking up var. *leptostachyus* for most American plants, accepts the inclusive bibliography of Boeckeler. I therefore take up the later name of Britton, that having no such obscurity as to its application.

C. dentatus Torr., forma **ctenostachys** (Fernald), stat. nov. Var. *ctenostachys* Fernald in Rhodora, viii. 126 (1906).

This plant with many-flowered elongate spikelets proves to be without distinct range and to be an extreme form rather than a geographic variety. M. L. Fernald

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Some Color-Forms of Gentiana Porphyrio.—The discovery by Mrs. J. Norman Henry near Wilmington, North Carolina, as reported by Dr. R. T. Clausen in Bull. Torr. Bot. Cl. lxviii. 662 (1941), of pink-flowered plants growing with the

typical azure-flowered plant clarifies the identity of *Gentiana Porphyrio* J. F. Gmel. It is now reasonable, as Dr. Clausen points out, to interpret Gmelin's name, given as a substitute for *G. purpurea* Walt. Fl. Carol. 109 (1788), not L. (1753), as resting on the purple or pink extreme, which, farther north at least is very unusual. In a damp sandy field west of Warren Grove, Ocean County, New Jersey, Mr. John Gill has found a colony with amazing color-variations, including typical "lavender"-flowered *G. Porphyrio*, azure-flowered *G. Stoneana* Fernald in Rhodora xli. 555, t. 579 (1939), other plants with the corolla white but with broad greenish backs to the lobes, and others variously combining blue and white. A series of these variations, collected by Mrs. Allan (Eleanor C.) Marquand, on October 3, 1940, is preserved in the local Herbarium of the Academy of Natural Sciences of Philadelphia and I am indebted to Mr. Long for an opportunity to study it, and for duplicate material of the albino. Since these plants are now coming into cultivation it will be convenient to have formal names for the more distinctive color-forms.

Gentiana Porphyrio J. F. Gmelin, forma **Stoneana** (Fernald), stat. nov. *G. Stoneana* Fernald in Rhodora, xli. 555, t. 579 (1939).

Forma **albocaerulea,** f. nov., corollis albidis caeruleo maculatis vel variegatis.—New Jersey: damp sandy field west of Warren Grove, Ocean County, October 3, 1940, *Eleanor C. Marquand* (type in Herb. Phil. Acad.).

Forma **albescens,** f. nov., corollis albidis plus minusve viridi suffusis.—New Jersey: damp sandy field west of Warren Grove, Ocean County, October 3, 1940, *Eleanor C. Marquand* (type in Herb. Gray).

M. L. Fernald

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